approach

NAVWEPS 00-75-510 THE NAVAL AVIATION SAFETY REVIEW NOVEMBER 1961

FLYING IN THE WORLD'S LARGEST ICEBOX

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Our Product is safety, our process is education, and our profit is measured in the preservation of lives and equipment.

approach

NOVEMBER 1961 ○ VOLUME 7 ○ NUMBER 5

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DEPARTMENTS

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LETTERS TO THE EDITOR

Small Outfit Quality Control

Barbers Point—In the July issue of your magazine appeared an article by C. R. Heinefield, ADC, VF-161, Cecil Field, requesting information on how a Quality Control System can be incorporated in a small outfit. Enclosed is information that may be of use to him and others.

S. W. SHIVE, AMHC VU-1

● Please see Chief Shive's discussion below.

Quality control is an all hands function and there is no reason why smoothly operating procedures cannot exist, on the shop level, in the smallest squadron or outfit. Since there can be no half measures in Quality Control, the major check, repair or even the smallest safety wire job must all be completed according to the best standards of quality workmanship. Of course, a separate Quality Control division would have its advantages here, but often the personnel are not available. In this case the following might prove to be a useful Quality Control system formula which, once initiated, could be altered to fit individual needs:

First of all a complete Work Order system, one in which all work is by maintenance work order, would be necessary. A work order or aircraft check received by the shop would be entered in a separate log or in one sectioned off by aircraft bureau numbers. These work orders would be reviewed by designated Quality Control inspectors; a limited number of the most proficient men available. When the work or check had been completed, it would be signed by the job crew leader and then given to an inspector for his check. This inspector should have periodically viewed the work in progress but should not have actually taken part in it.

If the inspection of the work proved unsatisfactory, it would be returned to the crew leader with an explanation of what is wrong. The work would not, however, be signed off by the Quality Control inspector until he was entirely satisfied with it. After the work was approved it would be entered in the appropriate log as completed. Any additional information considered pertinent would also be entered. It would then be returned to maintenance for filing and aircraft status.

Maintaining a work order log by aircraft numbers offers an excellent method for checking trends. In addition to the log, a chart can be made covering various systems. When a trend is noticed, it can be transferred to the chart for closer surveillance.

The Planning or Maintenance Office should maintain a complete up-to-date list of Quality Control inspectors. All inspectors should be appointed subject to the Maintenance Officer's approval and he should give his complete support to all Quality Control representatives.

Quality Control by this method does not require a separate division. It can be maintained by the existing compliment. Although this may require more individual effort, the end result of having saved a life, or a piece of valuable equipment, should prove most gratifying.

Dead and Buried

What ever happened to the Gremlins that plagued our aircraft during WW II? We never hear of them any more. Can you shed any light on this?

ANYMOUSE

● We really don't know but here's a possible explanation: Then, Gremlins were blamed for all kind of aircraft troubles. Today, with scientific failure analyses, black boxes, accident and incident investigation and so on, troubles are no longer attributed to imaginary elves. With true causes of troubles coming to light Gremlins just had to go the way of ghosts, witchcraft and other mysticism.

NC-5 Operating Pamphlet

NAS Glenview—Why not a pamphlet to provide guidance in the operation of NC-5s operating around aircraft?

OpNav 34P1 does not cover the complete scope involved.

Reduce the increasing number of accidents involving damage to aircraft by uninformed operators of NC-5s!

H. J. HICKS, CDR
Aviation Safety Office

● A flight line guide with suggestions to reduce this type of accident is already at the printers. It should be distributed by 1 October.

MOD Philosophy

FPO San Francisco—During a period lasting some 35 years, Naval Aviators who flew single engine aircraft would have given their eye teeth for some means of predicting the untimely demise of their engine. Lisle arrived on the scene and requested a much lower price. He found a welcome spot in my cockpit and a warm place in my heart.

Now to digress—we put two Naval Aviators in a room and tell them to design an instrument panel. Thirty minutes later they are observed to disagree violently on several items. The human en-

Achieving Safety

Safety—no matter how you look at it—doesn't come easy. You have to work at it, and you have to work for it. At the same time, true safety requires practicality lest it become a pure visionary goal instead of a down-to-earth, achievable end product.

S. B. Becker, Director of Operations
—Air Transport Assn. of America

gineering types at NADC would not, in all probability, agree with either of them.

This particular aviator disagrees with the location of the chip detector warning lamp in the HSS-1/1N as directed by Aircraft Service Change 152C. This change moves it from the area of my engine instruments to a position atop the instrument panel glare shield. Now the glare shield was placed there for a purpose—to keep all that bright sunlight off the instruments—and the warning lamp bezels. This is particularly important in the case of the chip detector.

When metal comes in contact with the Lisle plug it does not make an outstanding electrical contact between the outer magnetic surface and the non-ferrous center contact. Frequently the metal chips we are looking for are non-ferrous and only gravitational attraction forces them through the insulating film of oil which is essentially present. This contact is occasionally of such high resistance that only a slight glow will be observed in the filament of a lamp connected with a battery to the plug. When the lamp assembly is positioned so the pilot cannot look directly into the bezel at a small angle, and positioned so that the bezel is well shielded from incident and direct sunlight, it loses a good portion of its value as a warning aid.

A better location? In the engine instrument group directly beneath the glare shield. (Say a couple of inches beneath it.) All Naval Aviators with an eye to longevity scan the instruments several times each minute—try covering them up and see how frequently you want to peek.

LT P. M. HINES, JR.
Shops Officer

●We have checked the Aircraft Service Change thoroughly, discussed it with the chopper and maintenance people and believe that there are good reasons located primarily behind the instrument panel which make it impracticable to do as you request on your particular series bird. Suggest fabricating a small glare shield locally, painted black and mounted around the two lights in such a manner that both pilots can see it. You're still better off than some Marine craft, which have to have the lights mounted on the right console due to conflicting radio gear on the main panel.

Cut Us In!

Has information in any Safety Center publication ever helped you prevent an accident—prevent an injury — or better handle an emergency?

If so, and you have not reported it to NASC already, it is particularly important that you do so. This information is vital to both editorial direction and fiscal support of our safety education program.

Believe us when we say that the time, effort and funds for modifications such as this are critically needed in other areas.

Aye

La Mirada, Calif.—We would like your permission to re-publish in Sky Diver Magazine the article on page 38 of "Keep Your Distance" by a LTjg, in the April 1961 issue of your magazine.

JOAN CAMERON

● The baton is yours.

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, U. S. Naval Aviation Safety Center, NAS Norfolk, Va. Views expressed are those of the writers and do not imply endorsement by the U. S. Naval Aviation Safety Center.

Murphy in M-B

Farafield—One preflight check on the Martin-Baker ejection seat in an FJ-4B is to insure that the eye on the end of the small cable (from the secondary ejection handle) is on top of the eye on the large cable (from the face curtain). A perfect example of a potential Murphy.

Why not design the two eyes so that they cannot be installed improperly, or hasn't M-B heard about Murphy?

ANYMOUSE

● A Murphy is possible since the size of the cable eyes are the same; however, the shank and cable diameters are different. The installation is also easily checked by the pilot and quality control inspectors.

The objective of this installation is to allow the face curtain to pull free of the seat upon pilot-seat separation. This will not occur unless one of the cables detaches from the sear hook.

When the face curtain is pulled, tension is placed on the larger cable and none on the smaller secondary firing cable. As the sear is pulled the small upper cable is free to detach and does so easily due to less tension and smaller sear hook area. Martin-Baker has no record of both cables remaining on sear hook.

The results of the face curtain remaining with the seat would be that the pilot would have to release the curtain upon seat separation. Muscle strain is possible due to arm position if the seat curtain is jerked from pilot's grip. Firing from secondary lever requires pilot to release the secondary handle upon seat separation; however, the pilot's arms are in a more favorable position should the seat be jerked from his grip.

It is probable that the cables will detach from the sear hook regardless of installation order. The only acceptable installation is as specified in all instructions regarding this installation; big cable on the bottom, little cable on top.

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The four goggle covered eyes peering out at you on page 17 of the July APPROACH have resulted in one of the largest You Write The Caption responses.

Several very fine safety suggestions were submitted, among them this one from Capt. P. F. Oestricher, Ft. Worth, Texas.

"High initial current surge from an Air Force starting unit caused random popping of circuit breakers and failure to notice this caused a delay in gear retraction due to landing gear control breaker being out. Double checking the breakers is always a good policy."

Captain Oestricher also correctly identified the flying machine as a Curtis HS-2L which had a 350 hp Liberty, weighed 6400 lbs and reached a screaming 82 mph. (see page 25 July 1961 NavAirNews)

A sampling of the captions submitted follows. Thanks to all contributors.

"CLEAN GOGGLES!! OXYGEN MASK!! Is this some more of those newfangled ideas you picked up from the RAG?"—LTJG G. T. McCullough, HS-11

"Kick in the A/B, we're late for Happy Hour!"
—Capt. P. F. Oestricher, Fort Worth

"This is great, ain't it, Orville? Now if we can only get it off the ground"—

"I'll watch him, Commander, you stay on instruments."—

"I don't care what they say, this thing will never make it to the moon."—LTJG J. B. DeFrancesco, Jr., VP-18

"Well I'll be damned—I forgot the gas chits!"—

"George! Did you really forget the roadmaps again?" —
—LCDR L. W. Dilts, NTDC, Port Washington

"Do you think it's safe to fly this fast?"—

"Those 'tail hook' boys will never replace us."

"Do you think it will hold Joe? Grandpa took that wire off a fresh bale just this morning."—W. P. Moore, AC1, Whidbey Island

"I got it? No, you got it! Who? Me??" VA-12 Ready Room 3S FDR (CVA-42)

"Weightless! Whaddya mean you're weightless?"—LCDR R. H. Nickerson, Staff COMPHIBLANT

"Better slow down, you know it's against regulations to break the sound barrier."—Lee Rosamilia, V-1 Division, USS RANGER

"I won't tell you again, keep your hand off my leg."—Richard Sidney, AE2, VA-126

". . . nine, eight, seven, six . . ."—LCDR C. L. R. Anderson, OPNAV (Op-412D)

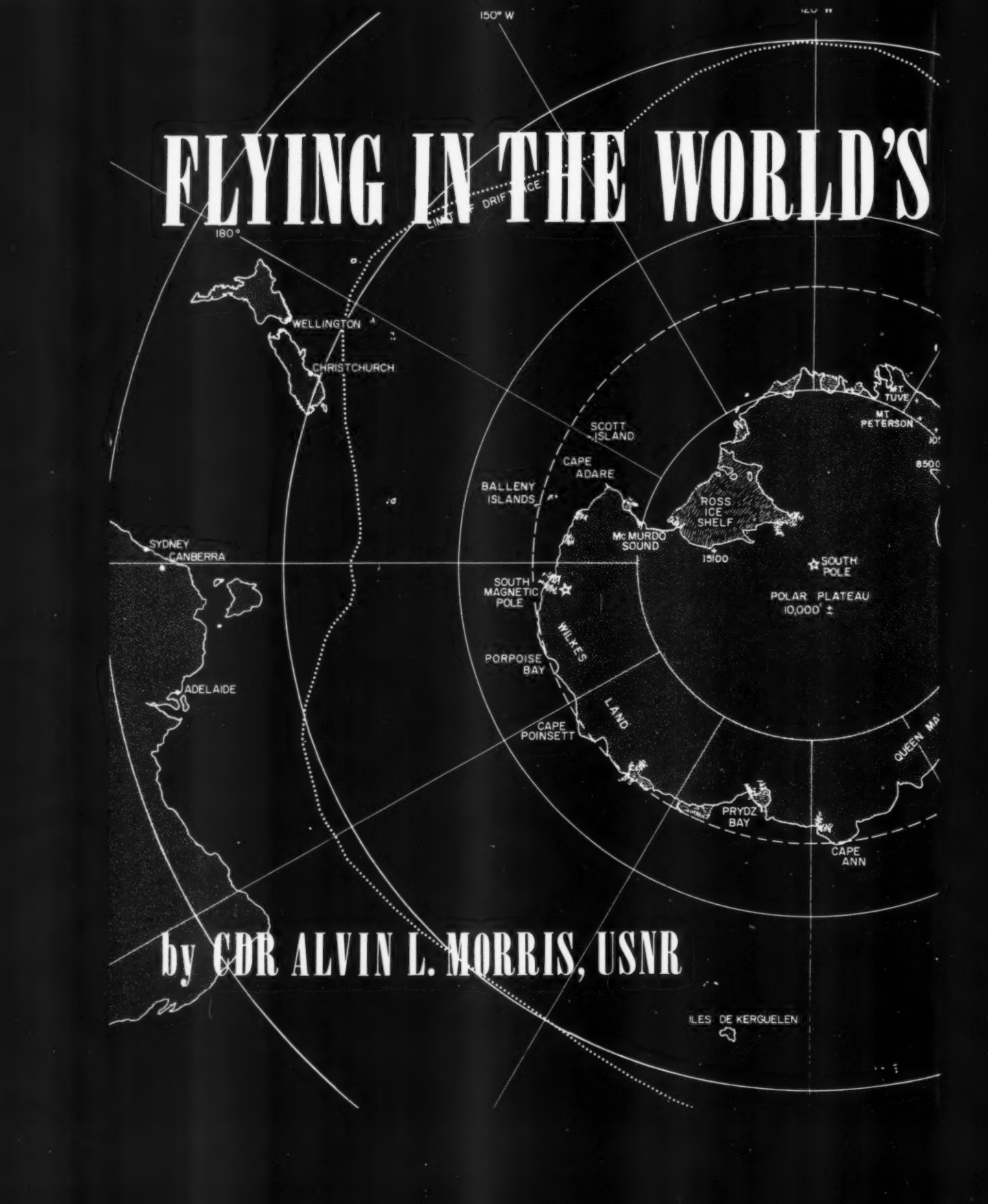
"You look this time Joe and I'll try and land the damn thing."—B. L. Laurance, ADRC/AP, NATTU Pensacola, Fla.

"On top again—we're never gonna get off this ferris wheel!"—LT D. B. Cave, LT J. L. Low, NATTU, Pensacola, Fla.

"Get that homing pigeon out of the crate, Joe, we'll turn him loose, then follow him home."—C. W. Debnam, AEC, PATRON 24

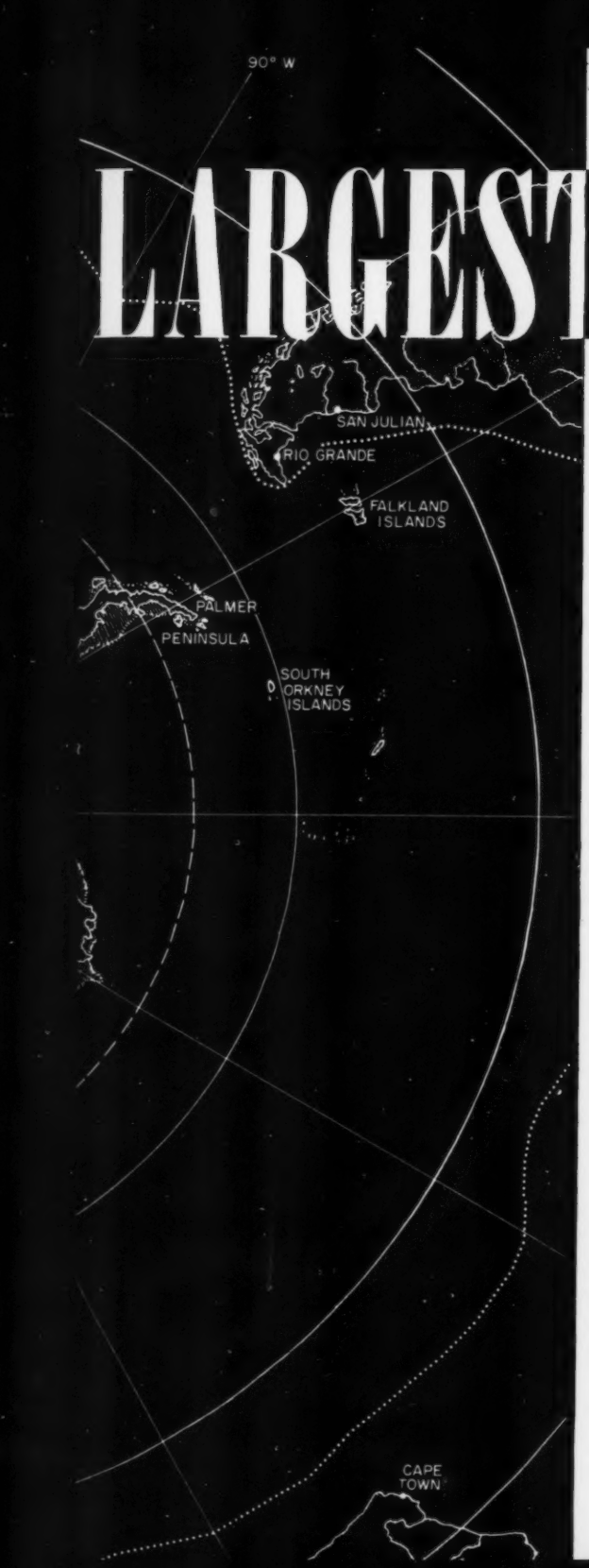
"Turn the plane around stupid—we're flying backwards."—

"Quick thinking Barnes, we are now in a tailspin, what the devil do we do now?"—
Anne Marie Garmain, YN3, CNABATRA Staff



FLYING IN THE WORLD'S

by CDR ALVIN L. MORRIS, USNR



LARGEST ICEBOX

ANTARCTICA, as the Antarctic Continent is called, is one of the world's last frontiers in the classical sense. Vast areas of it have not been visited by man, and much of it has never been viewed or mapped from the air.

Starting with the International Geophysical Year and continuing to the present, many nations have maintained scientific parties on the ice covered continent. To the U. S. Navy has fallen the task of supporting the United States effort in this work.

Ships can reach the coast during the austral summer (December through March) to deliver supplies, but there are no roads to the interior. Travel over the ice by dog sled or its modern counterpart, tractor, is slow and difficult. Also much of the resupply must be accomplished before ships can break through the ice to the coast if the full summer's work is to be completed. Consequently, aircraft have been pressed into service, and plane crews whose experience with snow ended when their youngest member outgrew his sled in boyhood may suddenly find themselves landing on a pile of the stuff two miles deep. Here are some of the problems they will face.

Long range aircraft can fly directly to Antarctica from Australia, Tasmania, New Zealand, Southern Argentina, and South Africa. The Antarctic Support Forces of the U.S. Navy have chosen to operate from New Zealand, the jumping-off point nearest to the Ross Sea, on which the United States has based most of its exploration of the Antarctic. The Ross Sea, cutting as it does deep into the continent, offers a good choice of bases for operations over the continent and affords one of the easiest approaches to the pole; and although it is a graveyard for many Southern Hemisphere storms, the weather is not as bad as it is along the Palmer Peninsula, the protrusion of Antarctica which extends northward to within about 600 miles of South America.

In addition to the 2100-mile route nearly due south from Christchurch, New Zealand to NAF McMurdo, flight crews may find themselves flying

from McMurdo 386 miles across the level Ross Ice Shelf to Little America, or 730 miles south across the Queen Maud Range to the pole, or 798 miles east southeastward to Byrd Station where they will land 5000 feet above sea level on a snow bank 10,000 feet thick, or to anywhere on the continent where this or that scientific party has need of equipment or supplies.

Facilities? Except for McMurdo where snow is compacted on the ice each spring to permit wheeled aircraft to land, and a few of the more permanent stations like Pole Station, Byrd Station, and NAAF Beardmore Glacier where the snow is smoothed for ski landings, there aren't any. NAF McMurdo has GCA equipment, and weather and field condition information is available by personal briefing and by radio at each of the more permanent stations.

Crews who are accustomed to the extensive navigational aids and the many hard-surfaced runways in the 3,500,000 square mile area of the United States are likely to find the 5,500,000 square mile snow and ice covered continent quite forbidding at first. Antarctica's only native inhabitants of consequence, the seals and the penguins, do not venture far inland. Airmen are more adventurous than these natives, however; and by the time the last man of a crew has grown a respectable beard, that crew will be flying routinely over some of the most awesome yet beautiful, terrain in the world.

Map of U. S. superimposed over outline of Antarctica clearly shows greater size of southern continent.

What of the small scale terrain features? What about the surface of the snow in these out-of-the-way places where aircraft must land, but where no landing strip can be prepared? Can it be trusted if it looks all right from the air?

No hard and fast answers can be given to some of these questions. Many successful landings have been made in areas where no advance preparations have been made. On the other hand, covered crevasses and sastrugi, wind formed ridges in the snow, can make an otherwise level snow surface dangerous. Some knowledge of what these are and how to look for them may help the flyer avoid them.

The ice which is stored in such quantities in Antarctica is not as dormant as it appears. It is in effect one vast glacier. As the snowfall of century after century accumulates on top of it, the great weight causes the ice to flow imperceptibly outward. As it flows past and over obstacles, stresses are set up which cause it to crack and give rise to crevasses. These are found in greatest number in the vicinity of obstructions where flow is most rapid, for example, on steep glaciers through the mountains. We expect few, if any, on the interior plateau where no mountains are to be seen and where movement is extremely slight. In general this is correct, but as if to prevent us from being cocksure, nature tosses in a joker now and then.

Recently, a party on foot making a traverse from Byrd Station to Amundsen-Scott Station encountered a great many crevasses where none should have existed. At least there were no mountains to be seen, but seismic soundings through the ice showed the mountains hiding a short distance beneath the surface. In spite of this exception, the ice on the high plateau away from visible mountains is generally crevasse free; nevertheless before making a landing in any unprepared area, it is well to check with a glaciologist if one can be found. Incidentally, there are more glaciologists per thousand inhabitants in Antarctica than in most neighborhoods.

The ice shelves in most Antarctic bays are scored by crevasses too. In this case, the cause is somewhat different. There are no mountains, to be sure, but tides are an effective substitute when the ice is floating. Crevasses in the Ross Sea Ice Shelf are being mapped, and the location of many are known. Undoubtedly, many have escaped detection. An attempt to land on a mapped crevasse would be inexcusable, but after one has assured himself that no known crevasse exists in a designated landing area, he can only look carefully and hope for the best.

Perhaps something should be said about how and when to survey a prospective landing area from the air. Because of the uniform coloration and the

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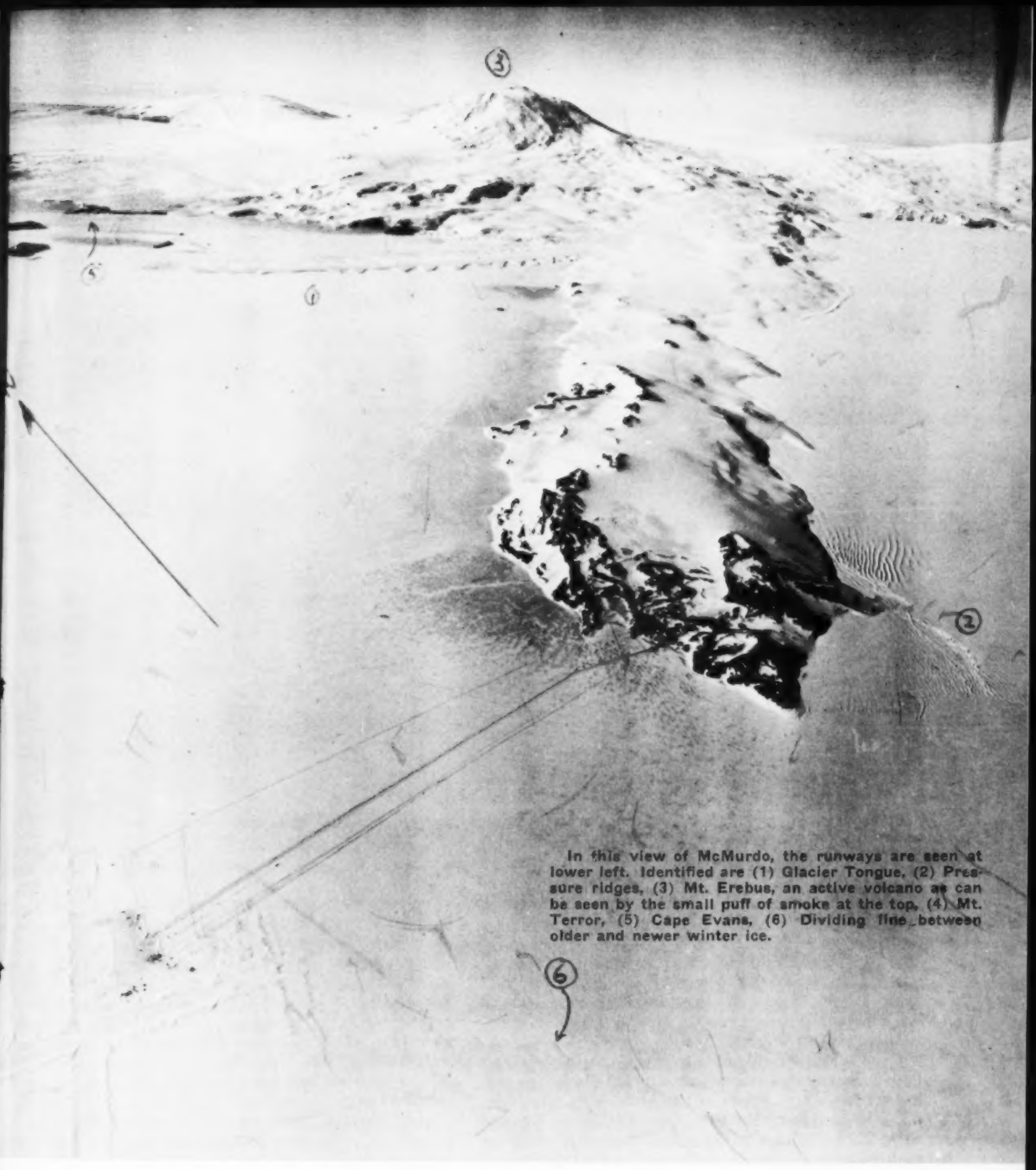
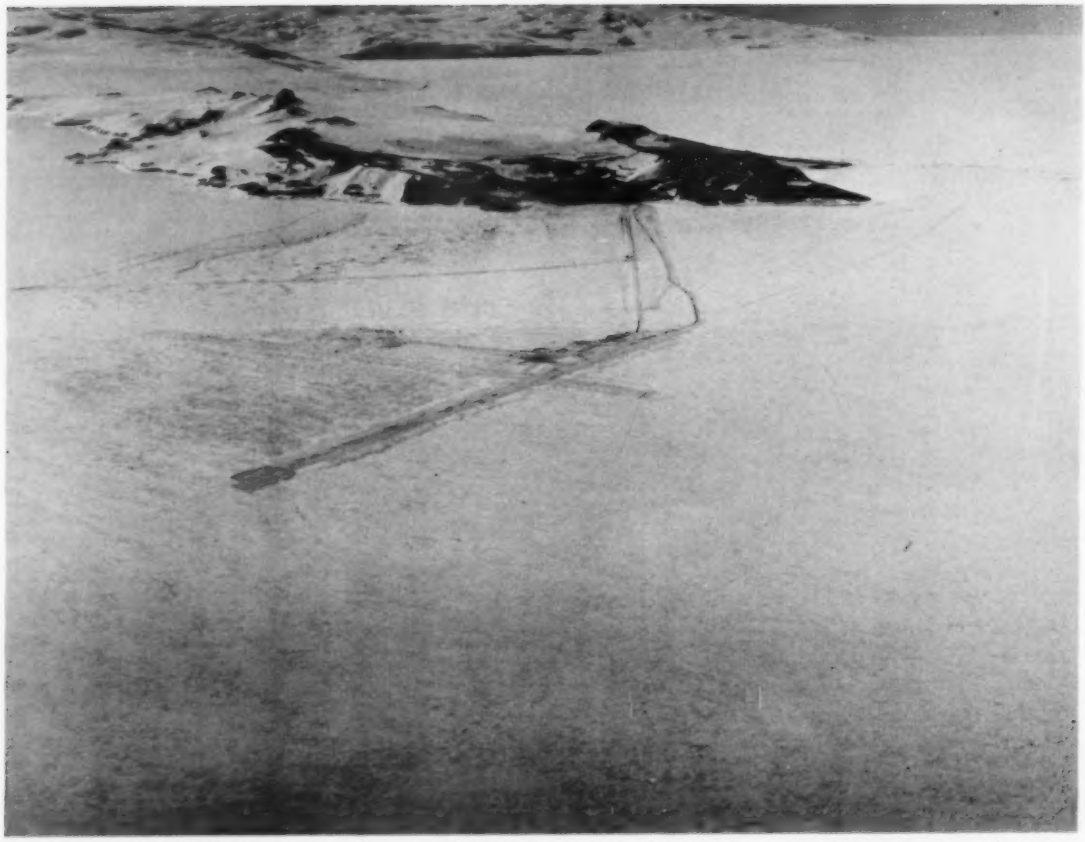


In this view of McMurdo, the runways are seen at lower left. Identified are (1) Glacier Tongue, (2) Pressure ridges, (3) Mt. Erebus, an active volcano as can be seen by the small puff of smoke at the top, (4) Mt. Terror, (5) Cape Evans, (6) Dividing line between older and newer winter ice.

smooth contours of the snow surface, surveys should be made only in the best of light. Direct sunlight which casts sharp shadows is best, provided the observer is not looking into the sun; the light under a uniform thin overcast can be quite deceptive; but the light under a uniform dense overcast is little better than no light at all.

Everyone knows that the wind drifts snow into



Another view of McMurdo shows the runway layout in greater detail. Those unobstructed approach zones are quite different from some stateside airfield but the lack of contrast is a hazard in "whiteout" conditions.

piles about obstacles which protrude into the wind stream, but even where no obstacles are present, the wind may mold the snow into a wavelike surface (sastrugi), and make a snow landing difficult. Sastrugi are formed when the wind drifts the snow in one direction for a prolonged period. Good light is equally important in assessing this hazard on a prospective landing strip.

Even more subtle pitfalls await the pilot who dares invade the snowy Antarctic. The more or less uniform appearance of the snow surface causes a loss of perspective, a loss which can be so serious as to cause a pilot to fly into the surface before he knows he is near it, even though visibility may be unrestricted. In its worst form, the loss of perspective becomes "whiteout." More will be said of this later.

On top of these hazards, the weather of the Antarctic limits human behavior to an extent not equaled anywhere else in the world. Merely surviving in far-below-zero temperatures can require such great expenditures of human energy that there is little left to devote to productive work. If nature superimposes a gale on the intense cold, survival may be more than a full-time job, unless the person is properly equipped and highly trained in cold weather survival techniques.

Over the years a relatively consistent picture of Antarctic weather has emerged. Because of the weather requirements of the Support Forces this picture may be biased somewhat toward the operational. Continuous meteorological observations were more likely to be taken at locations where important resupply operations were being carried out. More study has been devoted to those weather situations in which large scale air operations were possible. Analysis of these data for their scientific value alone will undoubtedly change some concepts

now held about the behavior of the Antarctic weather, but in the meantime, the bootstrap operation continues and American scientific groups in Antarctica are receiving the supplies they require to make their work possible. Let us look at some of the more interesting aspects of weather in the Antarctic.

In middle and polar latitudes in the Southern Hemisphere, as in the Northern Hemisphere, storms move from west to east. Storms moving toward the Ross Sea from the area between Australia and Antarctica may bypass the Ross Sea and continue on around the periphery of Antarctica, crossing the Palmer Peninsula and dying in the Weddell Sea; or they may move into the Ross Sea along its east side. Those which enter the Ross Sea may move inland over Marie Byrd Land, or they may move south and west onto the Ross Sea Ice Shelf. In either event they usually die within a few days after first entering the Ross Sea, only to be replaced by the next storm in an endless succession. The effect of this is to form a more-or-less permanent low pressure center in the Ross Sea area, and pressure there is often as low as in the center of hurricanes in the Caribbean. Fortunately these low pressures are not accompanied by hurricane winds and precipitation.

There is a great deal of argument among meteorologists today about the significance of air masses and fronts in the Antarctic. There can be little doubt that the high Antarctic dome is a source region for cold dry air. On the other hand, this air drains away almost as rapidly as it forms, and as it moves seaward it also descends and warms adiabatically. Thus it reaches sea level in relatively small quantities, and it is not markedly colder than the air in thermal equilibrium with its surroundings at sea level. It is undoubtedly colder and dryer than air moving southward from the open water though, and between these two air masses the prevailing storm tracks are found. With so few observations in this area, chiefly those of whalers who are so jealous of their positions that they don't like to make weather reports, it is not surprising that fronts are difficult to find. Without question, fronts do exist, but the position and precise type of any front found on a weather map must be considered doubtful.

We normally associate low temperatures with polar latitudes and high elevations. Antarctica, virtually centered about the south pole, has a mean elevation of more than 7000 feet; and a vast area surrounding the Pole of Relative Inaccessibility is nearly 14,000 feet above sea level. Low temperatures shouldn't surprise us; and, indeed, the lowest temperature ever recorded in nature, −121° F., was logged by the Russians near the Pole of Relative Inaccessibility. McMurdo Sound is a banana belt by comparison with its record low of −60° F.

In spite of the cold temperatures which are the rule all over Antarctica, warm weather is a frequent cause of difficulty to the Support Forces. Cold dry snow may be packed into a good roadway, and a slab of ice makes an excellent runway. But when the temperature warms up to near the freezing point, the snow-surfaced roadway becomes slippery; and if the warm temperatures continue for a long-time, the road may become a bottomless mire. Similarly, the bay ice of McMurdo Sound breaks up and drifts away, taking with it the ice runway, when the temperature remains high over a prolonged period.

To those of us who can't be lured out of our warm chairs in front of the fireplace when the temperature outside reaches the freezing point, it may be inconceivable that anyone could consider such temperatures too warm. This simply shows that man can be quite adaptable. He tends to tailor his activities to take advantage of his environment.

Wind is one of man's worst enemies in the Antarctic. It lifts the snow from the surface and hurls it in the face of the explorer. Even the flyer at several hundred feet may not be immune. The wind adds to the chill of the low temperatures. Thus the wind hinders by making the cold more piercing, reducing the visibility and making an otherwise smooth snow surface rough. Furthermore, by virtue of its very force on exposed objects, it makes navigation by any means difficult. Because of the combination of effects, a person can become irretrievably lost in the wind-blown snow although he knows he is not more than a few yards from his front door.

Fog can also be a serious problem in Antarctica. Along the coast the fog may be composed of either water or ice. The water fog is the kind with which the middle-latitude aviator is best acquainted. Ice fog is composed of tiny crystals of ice floating in the air. It limits horizontal visibility fully as much as does water fog, but it may be very deceptive to anyone looking down through it. Often a descending pilot can see through an ice fog and readily identify objects on the surface as long as he remains well above the surface, but he is likely to find that the visibility drops to zero just as he is preparing to touch down.

Ice fog is insidious. It may form almost instantaneously along a runway as an airplane lands, taxis or takes off along that runway; once formed, it may endure for days. There have been examples in Antarctica of several aircraft attempting to land on a strip where initial visibility was unrestricted, but on which the first airplane to land caused such dense ice fog that other aircraft were forced to turn away. An airplane sweeping an area preparatory to landing may come around to land in that area only to find it covered by ice fog. Cont'd

Flags, fuel drums, even rubbish are used to mark landing areas.

As the reader may have guessed by now, ice fog is generally a product of man's misuse of the atmosphere. Rarely is it found in nature where he has not poured the debris from his hydrocarbon-burning engines and space heaters. Ice fog is formed by the addition of water vapor to air which is so cold that even minute amounts of water saturate it.

Visibility is a topic of special interest in Antarctica. The atmosphere is normally almost crystal clear. It contains no dust, and the moisture content is almost always too low inland for the formation of fog—ice fog excepted especially where man interferes. Mountains at great distances may loom so clear and distinct that explorers think them near at hand; sometimes under optimum atmospheric conditions objects many miles beyond the horizon may be seen clearly and with little distortion. This is a form of mirage, and other forms are also common due to the great temperature contrasts which may exist over short vertical distances.

Another peculiarity of visibility, the whiteout and its related phenomena, has been mentioned earlier. The whiteout occurs when a dense, uniform cloud layer covers an unbroken snow surface. The uniform white above and below so diffuses the available light that there are no shadows. In fact, the observer of a true whiteout loses all visual references; neither direction nor distance can be discerned visually. The observer may walk into an open crevasse or a snow bank without having seen it. A snow covered mountain may stand in full view of the observer but not be seen, while a small dark object even farther away may be readily visible.

From the pilot's point of view, a whiteout should cause no trouble as long as his instruments are functioning and he remains well above the local terrain. When landing on an unbroken expanse of snow, the pilot should remember that whiteout can be a serious problem, however. In fact loss of perspective, which is complete in a whiteout, may still be serious when landing on a snowy surface even though considerable snow free terrain in the vicinity prevents whiteout. The pilot operating in the Antarctic must realize this and exercise due care. Dark objects (barrels, packing crates, or

All the elements of Antarctic flying are shown in this photo: Ice, open water, mountains, clouds and above all the barren and desolate nature of the land.

CDR Alvin L. Morris, USNR, is a civilian scientist employed as Chief of the Research Division of the Navy Weather Facility. As such, he is responsible for directing all weather research at the facility.

During his active duty he has been staff aerologist on several embarked Flag Commands. A tour on the Joint Staff of Commander in Chief, Alaska, gave him some first hand polar experience, but he admits the closest he has come to Antarctica is Manus Island, just a tad south of the Equator.

even, as at McMurdo, the remains of an airplane which didn't make it in one piece) placed judiciously along the landing strip and its approach will do much to overcome this problem.

What of the more conventional meteorological elements—cloudiness, rain, snow, thunderstorms, icing, enroute winds and so on? Are they problems, and what do we know about them?

Rain is rare in Antarctica, but it does occur on occasion in the coastal areas. Thunderstorms are virtually as rare as the proverbial hen's teeth. Snow in one form or another is the usual type of precipitation; but at the ground when falling snow is accompanied by blowing snow, it is difficult to separate one from the other. Either may severely limit the visibility, and it is in this respect that each is most hazardous to flying.

Clouds over Antarctica are usually made up of ice particles, and as such are dangerous only when they obscure mountain tops or when they form low ceilings over airstrips. Aircraft icing is not a problem in ice particle clouds, but along the coasts of the continent, water clouds may occur. To be on the safe side, clouds which give a substantial radar echo and in which the temperature ranges between freezing and $-20°$ F. should be avoided. If such clouds can not be avoided deicing gear should be checked and found operative prior to entering the clouds.

Turbulence may also be found in clouds, especially when such clouds are formed over rough terrain, but the clouds are not a necessary ingredient. Clear air turbulence is a frequent occurrence near important topographical features; this turbulence is usually light to moderate. In fact, severe turbulence has rarely been experienced anywhere in Antarctica. It must be remembered though, that the intensity of turbulence experienced in an airplane is a function of many things including the speed of the airplane. To a high speed jet airplane, severe turbulence may not be rare in Antarctica.

Returning to clouds, Antarctica can boast of some of the most colorful clouds which can be seen anywhere, the iridescent nacreous and noctilucent clouds. These are rarely, if ever, visible in the United States and they are most beautiful when the sun is a short distance below the horizon, a condition which endures for a long period each spring and fall near the pole. They are clouds which the pilot can enjoy but need not worry about since they exist at heights above the ceiling of any present day operational aircraft.

An equally colorful display is spread across the night sky of Antarctica now and then by the aurora australis. This also is too high to be directly hazardous to aircraft, but it is the visible effect of a shower of charged particles raining down on the earth from gigantic explosions on the sun. Auroral displays are invariably accompanied by difficult-to-predict effects on radio communications. It isn't difficult to predict that the effects will be bad, however.

Upper air winds over the Antarctic continent are not as strong as the winds found in the jet streams over the United States. In fact, most flying in Antarctica is done during the austral summer when winds are generally quite light. Winds aloft are not a serious problem; but the reader is reminded that they do blow in a clockwise direction around lows and in a counter-clockwise direction around highs; and he is warned to investigate the method of reporting wind direction near the pole before he accepts wind from the weatherman for his own use. After all, at the pole all winds blow from the north.

One plea to the pilot in Antarctica! The weather map from which the meteorologist in Antarctica must make his forecast is rarely based on more than a half-dozen reports. Compare that with the weather map of the United States, depicting an area only about two-thirds as large but containing hundreds of reports. Remember that even in the United States with all of these reports the weather forecast is rarely perfect. Don't expect it to be as good in Antarctica unless you cooperate with the weatherman by keeping your weather eye cocked when you fly and reporting what you see to him. He will be happy to furnish weather reporting forms which will make this as painless as possible.

FLIGHT DECK SALVAGE

MATERIAL failure of a port main wheel assembly during a touch and go landing left the pilot with prospects of a hook-down approach to the barricade.

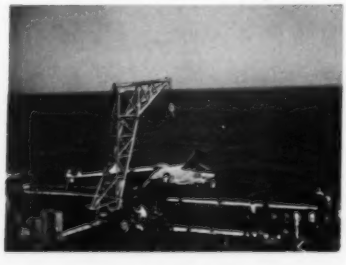
The bare strut picked up number one pendant and collapsed after pulling out 30 feet of wire. A slight swerve developed and the aircraft came to a stop at the very edge of the port side after 210 feet of barricade run-out. A slight "roll back" dropped the nose wheel into the catwalk. Recovering the pilot proved to be easy: A forklift moved into position near the cockpit took care of his problem. Photos show how Tillie took care of the *Crusader*.

As the plane was lifted and swung back on deck, padded dollies were placed under the port wheel and wing tip area. The whole operation, from barricade to clear deck took 25 to 30 minutes. Had the situation warranted, the landing area could have been cleared in ten minutes by dragging the aircraft out of the way.

A full hoisting sling was not used, wing and aft points eliminated, as the assistant flight deck officer felt there was enough risk putting a man on the nose section and did not want anyone working on the wing. A nylon sling was rigged around the aft fuselage and secured to the deck to keep the tail from going over the side when the nose was lifted and brought inboard.

This procedure was questioned by the accident board, since the aircraft was apparently resting "solidly" and not dangerous for wing sling and spreader bars to be rigged, but higher authorities felt the salvage operations satisfactory in that there was uncertain stability of the fuselage and it was deemed imprudent at the time to jeopardize salvage personnel any further.

Two photos at top show loss of tire and brake assembly. Following a barricade landing F8U is swung out of catwalk.



Despite the fixed gear, this OE-1 came to rest in the classic pose reserved for wheels-up belly landings. Trees in the background are at approach end of runway.

OOEEE!

UPON completion of a gunfire spotting mission the pilot of an OE-1 returned to the airstrip from which the squadron was temporary operating. When close to home he elected to shoot a simulated emergency landing from an altitude of 3500 feet. Winds at the time were quite variable and gusty, exceeding 15 knots.

The approach was normal with the pilot clearing his engine continually throughout the approach. He turned final with 500 feet of terrain clearance and at this point lowered 30 degrees flaps. "This is a good approach," commented the observer, "we've got it wired."

After passing over a row of 50-foot high trees at the end of the strip the pilot flared 10 to 15 feet above the deck. Only 171 feet from the trees the OE-1 made initial ground contact on the main gear in a flat or slightly nose-down attitude.

WHAMMMMM! BAMMM!

It did not bounce at all.

The main gear struts immediately collapsed and the plane slid on the belly for 55 feet. It came to rest 226 feet from the trees and 135 feet from the approach end of the runway. The tailwheel had not touched the ground until the aircraft had almost completely decelerated.

Like aeroplanes everywhere, the OE-1 obeys the laws of aerodynamics. In gusty winds and at low indicated airspeeds, if the wind suddenly decreases the airplane will rapidly develop an excessive rate of descent. In this case the accident board felt the pilot reached a low altitude where the effect of turbulence from the trees and a sudden slackening of the wind put him in a stalled or near stalled condition.

One result of the accident was to tighten up the use of practice emergency landings in the squadron; with simulated engine failures, landing approaches will be practiced only when prebriefed, on a syllabus training flight, and a waveoff will be taken at a minimum altitude of 100 feet above the runway.

Confusion Reigneth

The history of naval aviation is replete with accounts of aircraft accidents which occurred under very unusual or extraordinary circumstances. In many cases it might almost have been said that "this accident couldn't possibly happen," but unfortunately they did. The following is an account of one which falls into this category—no one believed it was possible until it occurred.

Two AD-6s were scheduled for an eight-hour strike mission over the mainland commencing with a pre-dawn carrier launch. Briefing was thorough and covered the procedures and signals for a night catapult shot. On manning his plane the pilot noted that he was parked aft on the flight deck in the vicinity of the arresting wires. He also noticed two jets parked outboard of his AD on the port side. The jets were being catapulted but were taking a little longer than normal due to downed aircraft and the fact that it was dark.

As the taxi director brought him out of the spot and gave him a right turn signal the pilot noted that he was lined up directly down the angle deck. It was at this point that he was first aware that he was to make a free deck launch rather than being catapulted. Although the angle deck centerline lights were not turned on the pilot was not unduly concerned, since he had made one previous takeoff during the deployment when the lights were not on. In addition, he was positioned much farther aft than was normal for an axial deck takeoff.

On receiving the turnup signal from the launching officer the pilot checked his instruments and added power. As he commenced his roll down the angle deck he heard his flight leader call over the air "deck lights." But they were not turned on. The only lights that were on

were the red deck edge lights.

The pilot stated: "My attention was fully concentrated on maintaining lineup and I was aware of nothing unusual whatsoever until my port wing came in contact with an obstruction. This 'obstruction' proved to be the forward-most three jets parked outboard on the canted deck. The first jolt was noticeable but not nearly the magnitude of the second jolt closely thereafter which left the impression of rotating my aircraft in a counter-clockwise direction. I strained to see any lights forward which I could use as a reference to indicate to what extent I was in the skid but found none. Next I made an effort to distinguish approximately what my attitude was, resigning myself to the fact at this time that a probable ditching was imminent. Seeing nothing but blackness and in the meantime maintaining full right stick and full right rudder to correct for what felt like a sizeable left yaw. I braced myself for the crash."

After the crash the pilot evacuated the cockpit and turned on his life vest flashlight. To give the destroyer a better position he lit off the night end of one of his flares. Droppings from the flare ignited a large pool of gasoline which had risen to the surface and he now found himself in the middle of a fiery inferno. Fortunately he was able to splash-swim his way out of the fire without being burned. Shortly after this he was picked up by the destroyer.

In analyzing this accident the board stated, "The one thing that probably would have prevented this accident would have been the communication of intentions between the pilot and the flight deck personnel. The pilot was sure that it was an angle deck takeoff and the flight deck personnel *assumed* that the pilot knew it was to be an axial deck takeoff.

As a result of this accident the board made the following recommendations:

► Adopt a signal to indicate to the pilot whether he is to make an angle deck or axial deck takeoff, especially at night. This can be a visual signal on a radio transmission.

► Make all angle deck takeoffs at night with the centerline lights on.

► That no deck run takeoffs be attempted when other aircraft are spotted near the path of intended movement.

► That flight deck personnel insure the proper positioning of aircraft for the intended takeoff path.

► Reemphasize to all pilots the inherent dangers of lighting off flares before making an effort to evacuate the immediate area of the impact—where the floating fuel and oil is most likely to be.

From an AAR Endorsement

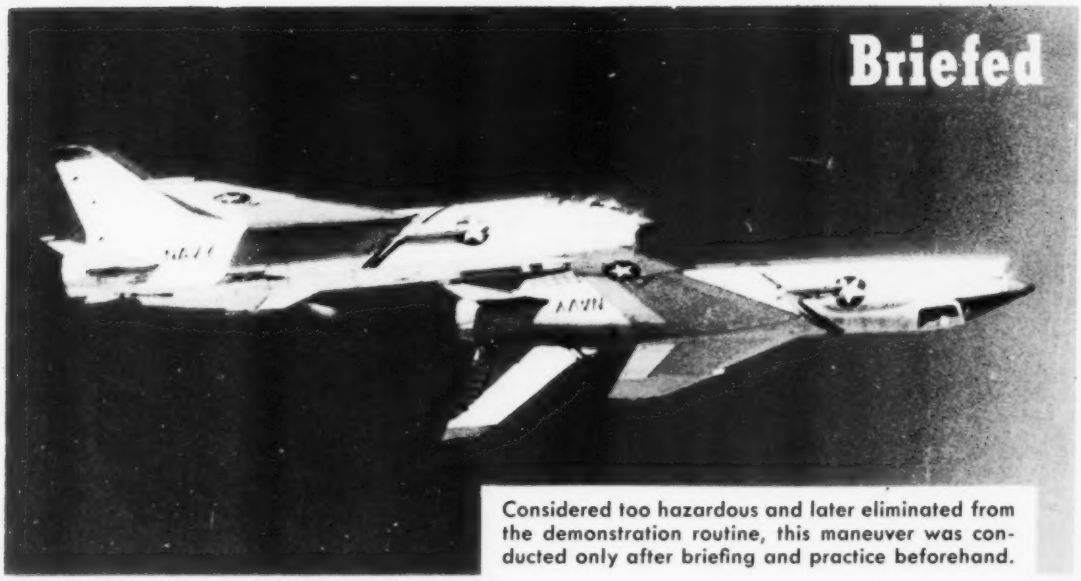
"There are extenuating circumstances to any accident but the approach to achieve safety of flight must be positive. Perhaps, because hazards such as ceiling and visibility, crosswind, snowbanks and icy runways are included in Center records as contributing factors, pilots and accident boards have been misled as to their true contribution. Snowbanks and icy runways most often contribute to the degree of aircraft damage but normally do not cause the mishap.

"Hazards such as ceiling, visibility and crosswind are factors which the professional aircraft commander is expected to overcome by applying accepted techniques in accordance with Standing Operating Procedures and good judgment. If the hazard is known to be beyond the capability of the pilot or the plane, then the Aircraft Commander is expected to use an alternate airport. If the hazard is within the capability of the pilot and the plane, and a mishap occurs, it can be considered only as an additional contributing factor, if it contributes at all. . ."

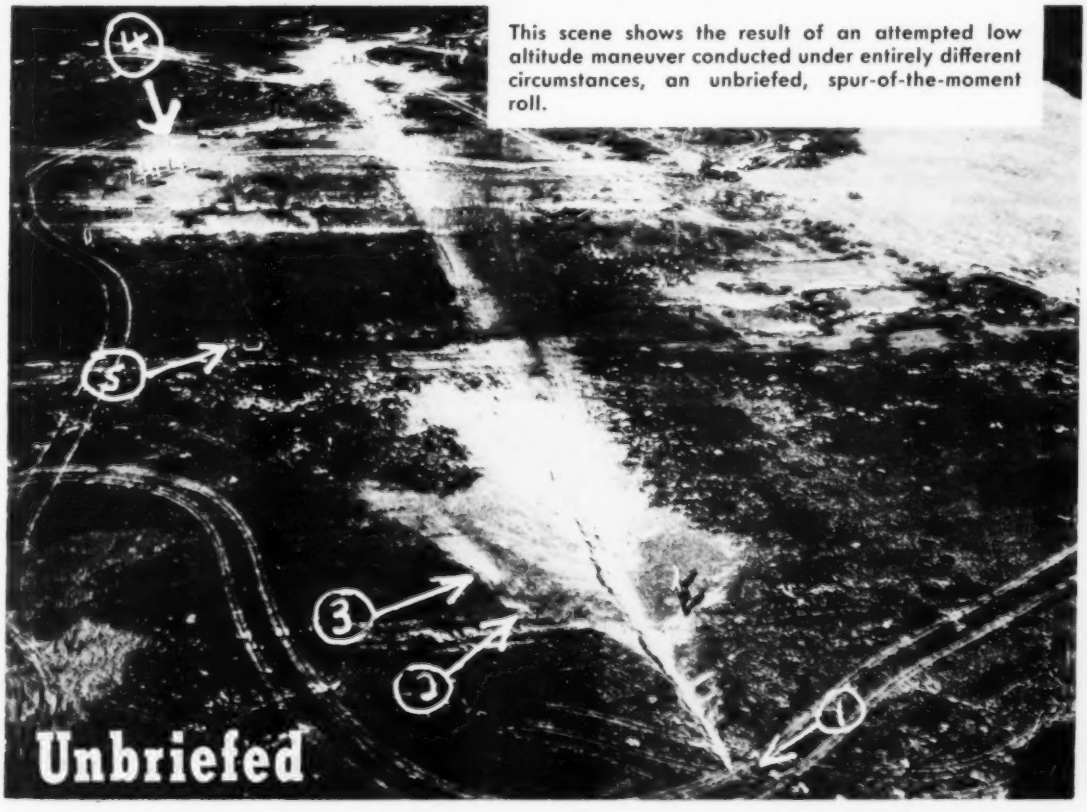
Disciplinary Action on AAR Endorsements

The Safety Officer, MCAF, reported on a recent notice concerning mentioning of disciplinary action on AAR endorsements. This is strictly forbidden by OpNavInst P3750.6D. AARs are privileged as stated in paragraph 70 of OpNavInst P3750.6D and are not to be connected with any report of disciplinary action.

—Commander Fleet Air Wing Six



Considered too hazardous and later eliminated from the demonstration routine, this maneuver was conducted only after briefing and practice beforehand.



This scene shows the result of an attempted low altitude maneuver conducted under entirely different circumstances, an unbriefed, spur-of-the-moment roll.

CRUISE CONTROL

by the Officers and Men of the USS FORRESTAL

Many articles have appeared in this magazine pertaining to a particular phase or function of aviation safety. These articles inform the reader that this is the "why" and "how" to do everything from carrier landings to hangar flying (July 1961). The dangerous and the safe methods are pointed out, discussed, and analyzed.

The story of the USS FORRESTAL and Carrier Air Group is proof that an effectively operating and combat ready ship is a safe ship.

FORRESTAL and Carrier Air Group Eight have just completed a second consecutive Mediterranean deployment without a single pilot fatility. These two cruises involved 49,000 flight hours and 21,000 arrested landings of which 3700 were night arrestments. This is no small amount.

The spirit and the full letter of aviation safety is standard operating procedure. The extras are competitive programs that scrutinize, criticize, and praise all phases. The Air Group Eight Safety Competition is scored monthly among the squadrons and detachments. This competition covers the areas of material readiness, landing proficiency, Flight and Hangar Deck safety and proficiency, accidents and hazards with personnel cause fac-

tors, and last but not least the Squadron Safety Program. The scoring is done by those most familiar with each phase. The score, for instance, assigned for Flight/Hangar deck safety is done by a committee consisting of the Flight Deck Officer, Hangar Deck Officer, Air Group Maintenance Officer, and Air Group Safety Officer. Landing proficiency is scored as a ratio of "OK" passes to total passes. In a similar vein, VA-81 and VA-83 have their own landing competition that rewards the "OK" pass and penalizes technique waveoffs, number one wires, and other tail hook-type malpractices. An "OK" with comment or a "fair" pass to the #2 thru #5 wire neither adds nor subtracts from the score. For aboard FORRESTAL, average performance is not praiseworthy and, happily, it is not the rule.

Squadron safety programs include realistic survival training in the field. With the assistance of FORRESTAL'S helicopters and one utility boat, a little exercise was conducted. Each intrepid naval aviator, garbed in flight suit and torso harness, was towed behind the boat on a nylon line and two parachute risers. Objective, to free the Rocket Jet fittings. This is not easy when wearing very wet, and very slippery flight gloves. Our damp hero swam to and climbed into a life raft for a too short rest. Then over the side and onto the helicopter seat, the three prong variety. The partially pooped pilot was hauled aboard the helicopter for a short trip around the park. Several pilots found it was very easy to become entangled in such things as the sea anchor line and any other flapping parts of the raft in the spray and downwash from the whirly bird. Nevertheless, he was trained to hang on to the raft until he had a hand on the seat. The pilot was then lowered back into the water and could then swim to the boat. He was considered qualified after he had climbed a cargo net hung over the high part of the bow of the utility boat. This was real training and considerably more difficult than the normal pool survival course.

This training for safety and survival was not confined to those on FORRESTAL. It spread to ships concerned with flight operations. Squadron Safety Officers and Survival Officers checked out seventeen plane guard rescue crews in each type of aircraft and each piece of pilot's personal equipment. A FORRESTAL Memorandum with sketches showing the normal and emergency escape systems of each airplane was supplied to each rescue crew. This training paid off in keeping FORRESTAL fatality free when an F4D driver had to part company with his machine one dark night.

From this record, it is obvious that the FORRESTAL—Carrier Air Group Eight team is a safe, hard working, integrated unit. The key is close cooperation, for close cooperation inspires professional competence and confidence. And it is surely there; in the wardrooms, on the flight deck, in maintenance, in Air Ops, on the Aviation Safety Council and each sub-committee, everywhere. This is what is required to fly more than 26,000 carrier based hours in 88 operating days.

Awards presented to FORRESTAL and her group over the past 3 years cover practically every department and squadron. It started with the Chief of Naval Operations Safety Award to FORRESTAL for FY58. Squadron award winners of this safety award have been VAH-5 in 1958 and 1959, VA-81 in 1960, and VF-103 and VA-83 in 1961. Four of the six squadrons in the Group have won this award during the past four years. Of these four, the two A4D squadrons, VA-81 and VA-83, were accident-free for FY61. As a matter of interest, in the past 2 years VA-81 has flown a total of 10,500 hours of which 7000 hours were from the flight deck of FORRESTAL without an accident, a tremendous accomplishment for any carrier based unit. VA-81 still flies the original 12 A4D-2s it received in March 1959.

As evidence of her effectiveness as a combat unit, FORRESTAL "hash marked" her 1960 Atlantic Fleet Battle Efficiency "E" and won Departmental "E"s in Operations, Gunnery, Engineering, Communications, and Air; a clean sweep of every possible "E" for attack carriers. And right along with "Home Plate," VF-103 won the "E" for VF (visual), and VA-83 won the "E" for VA (jet).

ARE YOU FLYING IAW*?

by CDR C.A. Commander USNR
& LCDR R.B. Satterfield USNR

If you have been flying military aircraft for any length of time you probably have been, or been close to being, an aeronautical lawbreaker. Considering the number of instructions dealing with operation of Navy/Marine aircraft, it's not surprising that laws are broken with the pilot remaining unaware of his action.

However, ignorance is no defense in the Skipper's office or at the end of the long green table. The way to avoid this is to know the contents of these numerous instructions but few, if any, pilots can dredge up any degree of enthusiasm for a complete search for pertinent instructions dealing with his trade.

The problem reveals itself in a series of questions: Where do I begin? Where do I find the time? Where do I get the info quickly, without wading through a swamp of unrelated material?

For a starter, check over the following descriptive list and circle those which are of interest to you. Then pick two or three instructions per day and look them over. (The Admin Office will normally have the complete file.) If there is no slack period during the normal operating day, set up the reading program as a "foul weather project."

In the early stages of your reading, stick to the 3700 series and this will automatically steer you toward the bulk of the pertinent material. Later on you can expand the search into other series.

One small problem which may be encountered is the issuance of Fleet or Unit Instructions relating to a particular OpNav or BuWeps Instruction. The Fleet or Unit may publish minor adaptations or more stringent procedures but it will never change the intent of the higher command.

* *IAW—In Accordance With*

Continued

aircraft Amplifying instructions	NAVAIRLANT 3740.10B NAVAIRPAC 3740.8A
Radar approaches—basic voice procedures to be used	OpNav 3721.4A
Required reading—minimum list of publications and regulations	CNARESTRA 3750.20B
Stress limitations on aircraft—importance of observing	OpNav 3710.1
Test flying—post-maintenance requirements for	BuWeps 3700.2
Turbulence—methods of setting up limitations for flight in turbulence	BuWeps 3710.3
Thunderstorm flying—recommended flight procedures	OpNav 3710.5
Transient aircraft—escort by "follow-me" vehicles	OpNav 3750.15
Violations—procedures for reporting and recording	OpNav 3750.5A
Joint USAF/Army/Navy regulation on reporting and investigations of alleged flight violations	OpNav 3760.1B
Vision—night	OpNav 3700.2
Wheels-up prevention measures	OpNav 3750.7A

This list does not purport to be a complete collection of regs which may be of interest —other important ones, especially Fleet, Fleet Air, and Squadron instructions will need checking. Every effort was made to insure accuracy; however, some of the Instructions may be modified by late changes.

Flight Requirements

	UNDER 45 NOT DESIGNATED 20 YEARS OPNAV INST 3710.15C	UNDER 45 DESIGNATED OVER 20 YEARS OPNAV INST 3710.15C	OVER 45 NOT DESIGNATED OVER 20 YEARS OPNAV INST 3710.15C	OVER 45 DESIGNATED OVER 20 YEARS OPNAV INST 3710.15C	MUST FULFILL YEARLY FLIGHT REQUIREMENTS OPNAV INST 3710.15C	MUST FULFILL MONTHLY FLIGHT REQ. FOR PAY PURPOSES OPNAV INST 3710.15C	NOT PERMITTED TO FLY OPNAV INST 3710.15C	MUST FLY WITH QUALIFIED CO-PILOT SUPERSD BUMED MANUAL	MUST POSSESS VALID INSTRUMENT CARD OPNAV INST 3720.2A	CANNOT OPERATE OFF OF AIRCRAFT CARRIER AS PILOT SUPERSD BUMED MANUAL
CATEGORY I	✓				✓	✓			✓	
CATEGORY II			✓		✓	✓		✓		✓
CATEGORY III		✓			✓					
CATEGORY IV				✓			CAN WITH SECNAV OK	UNDER SPEC. WAIVER		✓
GROUP I	✓	✓			✓	✓			✓	
GROUP II	✓	✓			✓	✓			✓	✓
GROUP III			✓	✓	IF CAT. I, II, OR III	IF TEMPORARY DUE TO MEDICAL		✓	IF CAT I	✓

OPNAV INSTRUCTION 3710.15C

FLYING REQUIREMENTS

	CATEGORY I	II	III	IV
1) MINIMUM PILOT TIME FISCAL YEAR	90	48	48	0
2) MAXIMUM PILOT TIME FISCAL YEAR	100	60	60	0
3) PILOT TIME EACH SIX-MONTHS	35	24	24	0
4) NIGHT PILOT TIME FISCAL YEAR	15	7	7	0
5) NIGHT PILOT TIME SIX-MONTHS	6	3	3	0
6) INSTRUMENT TIME SIX-MONTHS	10	5	3	0

Note: Pilot time includes all time credited as ist pilot, co-pilot, and dual pilot. Special crew time does not count toward satisfaction of the annual pilot time requirements set forth in this instruction. Special crew time, however, is creditable for incentive pay for the performance of hazardous duty.

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PACK RAT

IN a recent day carqual period, each of seven AD-5 pilots were to receive 10 arrested landings, followed by a divert to home field. We were all straight from CNAVanTra with shiny gold wings and along with the trap landings we were introduced to cat shots.

After five traps and the same number of cats, I turned downwind, placed the gear handle DOWN, watched and felt the main mounts "thunk" into place. But I looked in wonder as the tailwheel stubbornly indicated UP. I cycled the gear twice with the same negative results.

All this time I was remembering that this same plane had done the same thing on two different days during FCLP and both times the trouble was traced to a faulty micro-switch. I called the LSO at the 90, told him my troubles and said I'd make a low pass over the platform. Paddles checked my gear down and I completed the period (five more traps and cat shots) then bingoed home. Prior to the final landing a wingman checked my tailwheel again.

When the tin-benders crawled into the after compartment to repair the faulty switch they found a shambles of electronic gear, broken wires, . . . , all caused by the berserk action of a 35-pound tailwheel jack which had been left adrift in the compartment. You can imagine what was happening to the jack during the series of arrested landings and cat shots. It had finally lodged in the micro-switch assembly and prevented my "three in the green."

The man who left it there said he didn't have the key to the tool cage and wanted to leave the jack in a safe place. The plane captain had noticed the loose fasteners on the compartment door but he assumed that they had worked loose during the previous day's bounce, so he simply closed them, despite the fact that a check of the after compartment is part of the standard plane captain's preflight.

I, as pilot, was in a hurry to get going with the period be-

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. As the name indicates these reports need not be signed. Forms for writing Anymouse Reports and mailing envelopes are available in readyrooms and line shacks. All reports are considered for appropriate action.

— REPORT AN INCIDENT, PREVENT AN ACCIDENT —

cause the ship had cut us off early the day before for being slow and the flight wanted to show them that in reality we were a sharp outfit.

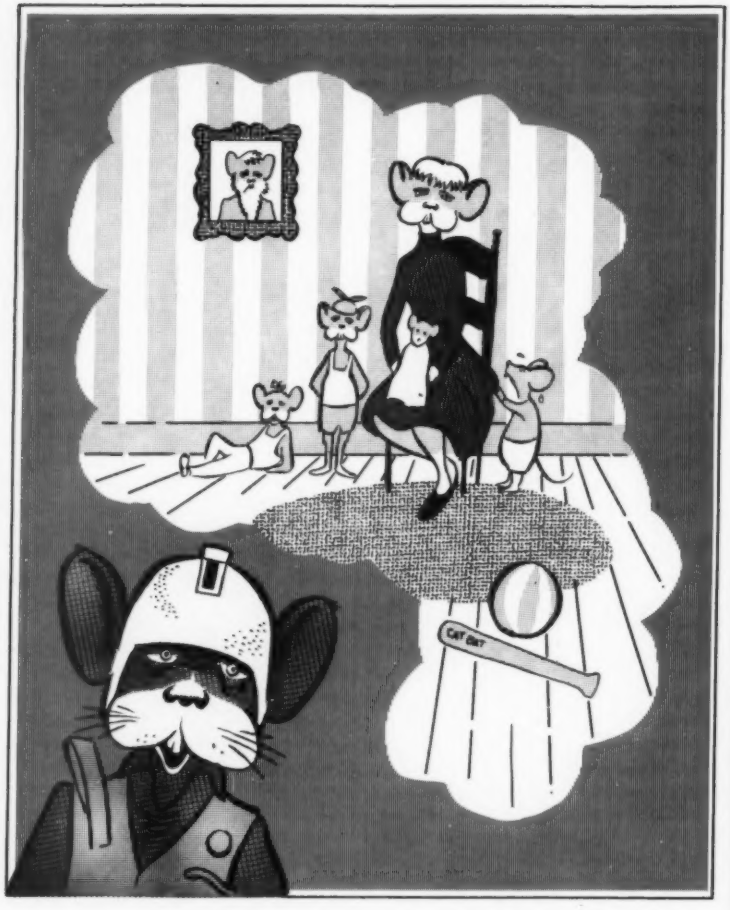
PX Trouble

It was one of those quiet Friday afternoons so I decided to leave the office early and go down to operations and prepare for a scheduled hop in the TV-2. At Operations I found that the pilot who was scheduled to ride with me was unable to fly. The back seat would be empty unless I found a crewman or another pilot who was interested in flying to Moffett Field, returning that evening.

There were no volunteers from the flight line crew so I called NAS passenger lounge and said I could take one pilot to the San Francisco area. The response was immediate. A pilot came to the phone and asked if I could fly into Travis Air Force Base instead of Moffett. I answered "Why not?"

While he obtained flight gear, I replanned the last leg of the flight and put his name and number on the DD-175. Ten minutes later, I was filling out the yellow sheet at the line shack, my passenger showed up and we went through an introduction. I asked him how much flight time he had and he answered "3000 hours, mostly all multi-engine." He added that he had flown in the TV-2 once before and was current in the pressure chamber.

Since he wasn't current in the airplane, I gave him a 10-minute cockpit check including the oxygen equipment. While I was preflighting, the plane captain helped him strap into the rear seat, remove seat pins, etc. "Doublecheck your mask hook-up and operation, and go through your rear seat checklist," I told him. "Everything is fine," he assured me and added, "This is great." So we took off and climbed on course.



To keep my passenger busy I asked him to operate the omni while I did the flying. He was happy to get this flight and said he was going to spend a few days leave with his family.

After an hour at 36-thousand feet, he commenced having transmitter problems on the ICS, but he assured me that he could hear all right. The cockpit altimeter indicated about 27-thousand.

In order to get more time on the hop I had filed a roundabout route toward Las Vegas. I was listening to Beatty radio weather on the omni and when the broadcast was complete I asked the rear seat pilot to tune in Coaldale omni, our next checkpoint. After asking him several times and receiving no response, I decided the ICS was bad so I tuned in the station myself.

I twisted around and looked back at him. He was sitting upright but with his visor down I couldn't see his face. More ICS talk failed to bring a response so I gave him an interrogatory "thumbs up," hoping he was okay. There was no reply to this but his head was bent forward slightly and I decided he must be looking at the radios trying to

get them operating.

Then I felt a pressure on the stick. I thought he was trying to get my attention so I turned around again and gave him another thumbs-up. He answered me this time by flopping unconscious against the canopy. This time I could see his ghost-white face peeking out from under his visor. I looked again and saw his oxygen mask was about ¼ inch loose over his nose.

"Ye gads!" I thought. "Where do I go now?" Should I dive immediately?—I have to! If I reduce power the cockpit pressure will drop even further and he needs oxygen fast. I nosed over and turned on the defrost which blows excess air into the cockpit and looked for the nearest military airfield. A civil 5000-foot strip would be all right in such an emergency but none were listed on the chart. Both NAS China Lake and Nellis AFB were the same distance away—about 100 miles—so I headed for China Lake.

Passing through 18,000 feet I could hear breathing over the "hot mike" and the next thing I heard was a query "Why is our red gear light on?" I explained what had happened but he couldn't believe me! He said he felt "fine." I had him go to 100 percent oxygen and tighten his mask. In fact I told him to keep his hand on the mask and hold it tight against his face.

After a few minutes he continued to talk rationally and said he felt good enough to continue to Travis if we had enough fuel. I cancelled my emergency with China Lake and turned west toward Fresno climbing. At altitude we would have plenty of fuel.

I kept constant radio checks with my passenger and requested he start telling about his family, since I knew if he was talking he was still conscious. After passing Fresno his ICS transmissions started breaking up again and this time, with his visor up, I could see his eyes starting to close. I yelled at him to hold his mask tight to his face and rocked the airplane to keep him awake. I also let down and contacted Travis tower.

The passenger revived and this time realized his condition. He remained rational and conscious for the remainder of the flight (made at 24,500MSL) and after landing he showed no ill effects.

It took me a couple of hours to calm my own nerves before I took off for the return trip home. Because my passenger was unconscious during my excitement he was more embarrassed than anything else.

As unreasonable as it might sound to some, I believe that experienced, seasoned prop pilots are not *jet* pilots. It takes more than a one-time checkout in the pressure chamber and an occasional cross-country flight in a jet. Safe high altitude living requires continued experience and training in the use of oxygen equipment and the effects of hypoxia and hyperventilation.

Mix Up

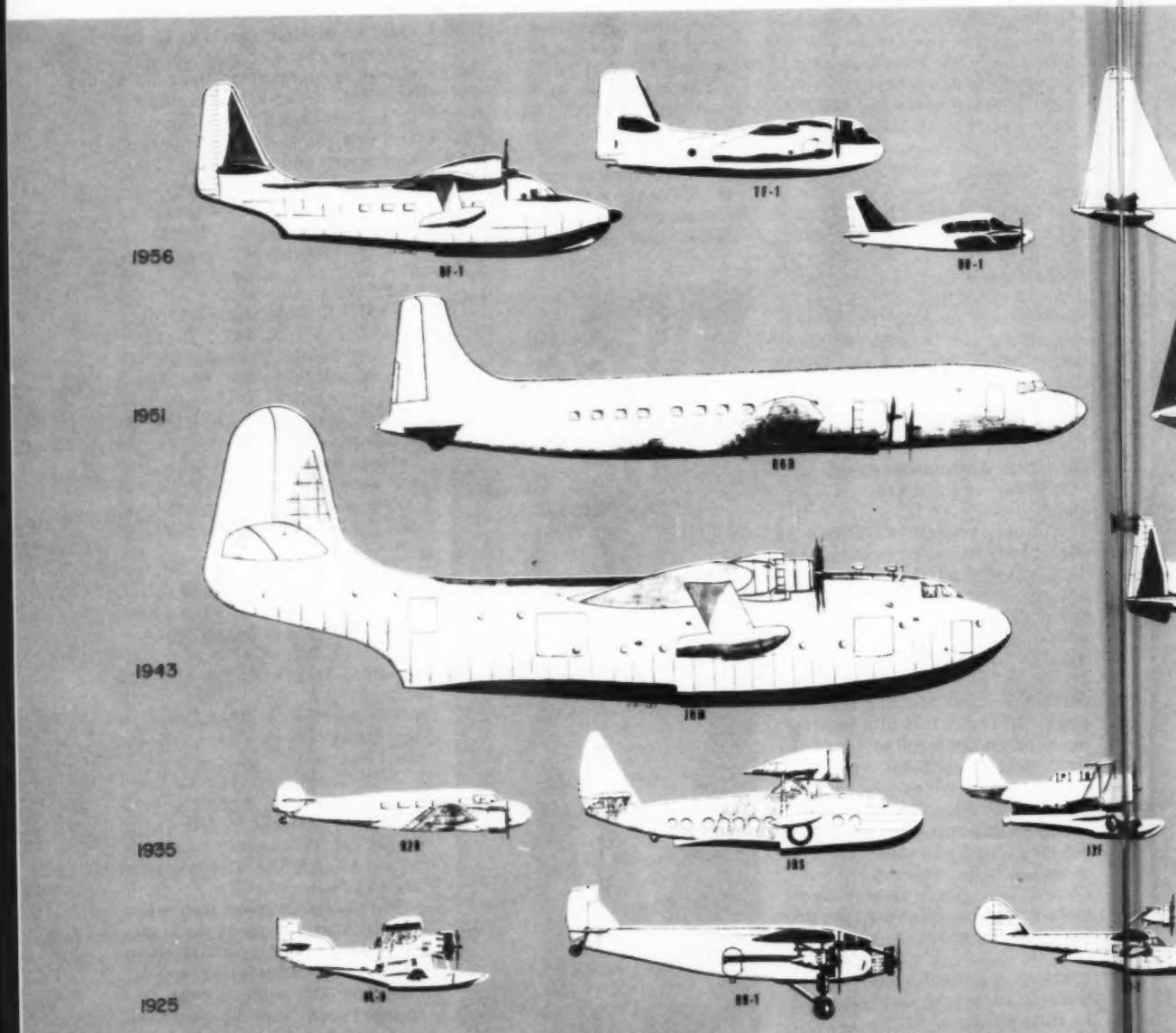
WHILE motoring along at 7-grand in a T-28, two young proficiency pilots were contemplating shooting a few touch-and-go's at a nearby field. The pilot in the rear seat was flying the machine and came up on the intercom and said the tower was on channel 16. The front seat pilot said "Roger, I've got it" and he then called the tower for clearance.

At this point the Torn-28 commenced a steep right-hand spiral. As 3000 ft passed on the altimeter, both pilots began wondering what the other was doing. At 2000 feet, with the airspeed approaching 320 knots, both pilots asked each other "what in the blue-eyed world are you doing?"

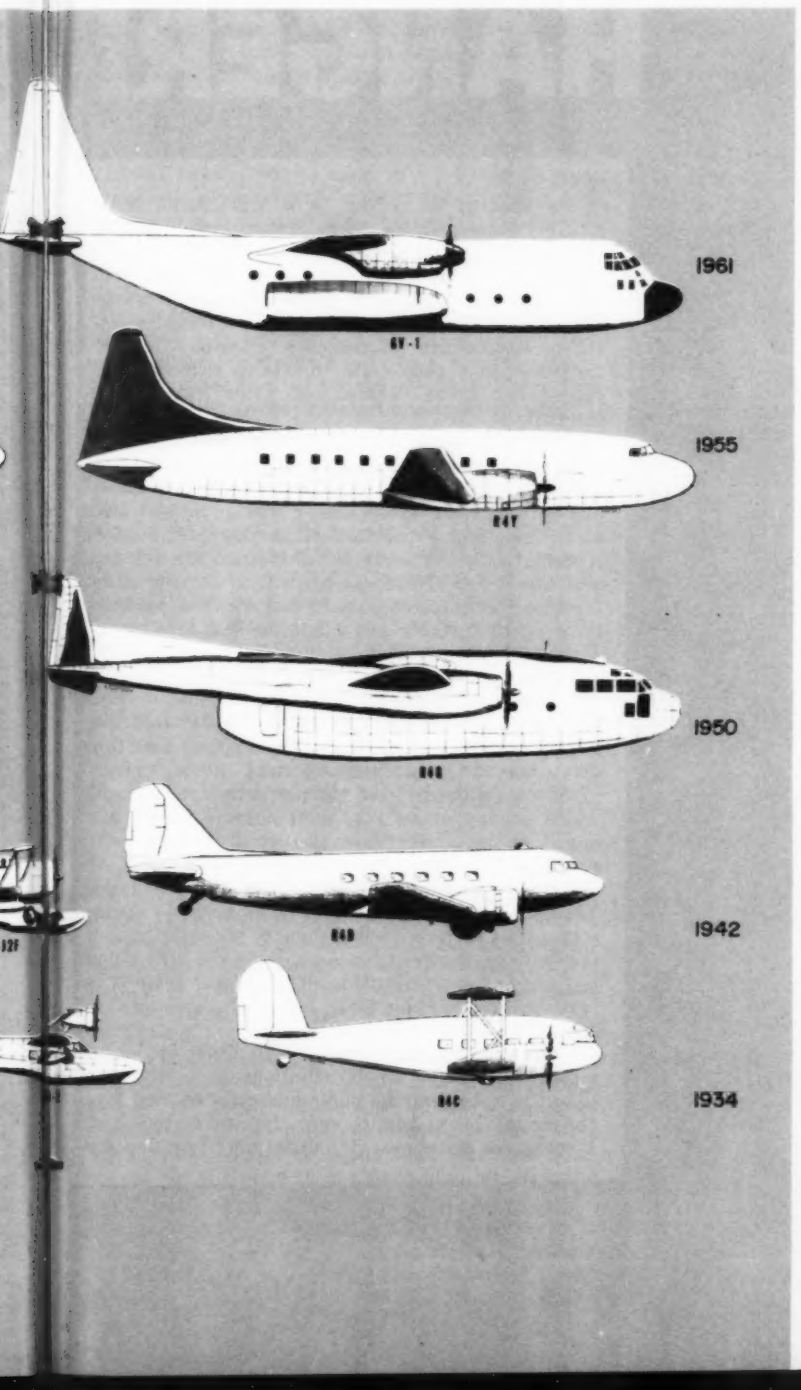
With that exchange both knew what happened and so both rolled wings level and pulled back on the stick. Recovery was made at 1500 feet. The accelerometer showed 6½ G.

We finally deduced that when the pilot in the front seat acknowledged the transmitter channel number with "I've got it" (meaning the correct radio frequency) the man in the back seat believed flight control had shifted to the front seat. Wow, wow! There have been plenty of warnings about this situation but we never thought it could happen to us.

DEVELOPMENT OF TRANSPORT AI



T AND UTILITY PLANES



The most familiar aircraft in a military organization are the combat types; their mission and activities make that inevitable.

Not so well known are the airplanes which do the variety of chores necessary for the support of the warplanes—the transport and utility aircraft.

The OL-9 shown at the lower left on the chart was a late model, earlier ones being powered by water cooled Liberty engines. Although the Loening amphibians were given an "Observation" designation, they spent the greater part of their service life in "Utility" duties.

One early transport equally as famous as the RR-1 Ford Tri-motor was the Tri-motor Fokker RA-1 operated by the Marine Corps. As the VR/VU class developed, the Navy maintained a strong interest in amphibians.

Coming into service shortly after the JRM "Mars" was the Lockheed R60. It's 156-foot length exceeded that of the JRM by 36 feet but the JRM's 200-foot wingspread was greater by 11 feet than the span of the R60. These two giants were the Navy's largest transports and their bulk can be contrasted with Piper's small, nimble UO-1.

Many readers may object to the absence of the SNB and R5D from this chart; we can only answer that the "Beech" will appear in the "Trainer" chart next month. It was difficult to leave out the R5, we all have spent many hours aboard them in perfect peace of mind, but the R6D was considered more appropriate from a "development" stage.

CLIFF HANGER!

The pilot of an A4D-2 in a flight from NAS Atsugi, Japan, made three unsuccessful relight attempts after a flameout. After the third attempt, he realized he was approaching mountainous terrain and was indicating 14,000 feet. He transmitted that he could not relight and would eject. He rechecked the instruments, checked his feet on the rudder pedals and mentally reviewed the procedures to be carried out after leaving the aircraft. . . .

"The face curtain came forward with no difficulty and, although I can remember two separate 'clicks' or 'bangs,' the ejection seemed simultaneous with curtain extension. I was surprised also at the seeming gentleness of the catapult stroke. Automatically releasing the curtain, I felt for the seat but it had already separated. I was tumbling with no recognizable pattern but was not particularly uncomfortable and made no real attempt to stop it.

"After perhaps 15 seconds of free fall, I pulled the ripcord and threw it over my shoulder. The opening shock occurred so quickly that it forced a grunt from me, yet again I was surprised that this shock was not greater than it was.

"I was relieved to see the perfectly symmetrical white canopy above me, then became mildly annoyed at my oscillations, the weight of the seat pack on the backs of my legs and the lack of clearance between the risers for my helmeted head. The oscillations were not violent as much as worrisome and I soon controlled them to my satisfaction. Oscillations occurred twice again on the way down but were of short duration. The descent seemed to take an interminable time as I had absolutely no sensation of movement.

"The aircraft crash caused a brilliant explosion which illuminated my parachute canopy. I was relieved to note that the plane had crashed well into the mountains and in, or very close to, a creek bed. I could see no signs of habitation. The fire ap-

peared short-lived.

"Looking below me, I saw a small town and, conscious for the first time of my drift over the ground, I felt that I would land there. I attempted to check my drift but gave up as it seemed to require more effort than it was worth. Beyond the lights of the town I could distinguish the outlines of a creek bed but I could not decide whether this was a small stream or a large river.

"I received my first impression of sink rate at about this time as I could see the sharp outline of a mountain 'rising' rapidly behind me in the moonless but clear night. I then gave up any thought of again slipping my parachute for direction control—I didn't want to risk increasing my descent rate. I was drifting slowly backward but made no attempt to turn around since, backward or forward, I still could not discern the nature of the terrain below me nor could I get any idea of the time that I would touch down. Despite the fact that I suspected I would land in a wooded area, I placed my hands high on the risers, held my legs together with knees unlocked and tried to relax.

"My landing was unbelievably gentle and I remained standing on the ground with my chute tangled in the trees. I landed on a very steep hillside covered with dense underbrush and small trees which were only 6 to 8 feet high. The hill sloped an estimated 70 degrees. My chute apparently caught in the trees above. Once I disconnected from my chute, I had to hold on to a small tree until I could dig out a seat for myself. I could still see the creek below but could not determine its distance from me or its size. I worked my parachute free and tied one end to a small tree below me. Next I took my seat pack apart and separated the items I wanted from those which I felt I wouldn't need. I was anxious to get the radio out for I knew it was my only hope of telling my playmates that I was all right.

"Having packed my pockets with everything that I could carry and readied my flares and radio, I attempted to climb down the slope using my parachute as a line. Within 10 feet I found myself dangling over a cliff. I could not see how high it was and could find no toe holds. Placing my radio against a tree, I climbed back up the parachute. I accidently kicked the radio into the chasm.

"Trying to move at an angle down this slope proved equally difficult. My one-cell vest light was in good order but was simply not strong enough and did not focus well enough for me to see more than three feet through the brush. Leaning over the face of the cliff with this light revealed nothing of the distance to the next possible stopping point. I was anxious to get to the creek because I knew I could then easily find my way back to town and a telephone. I attempted to determine the height of the cliff by tossing my solar still over and timing the impact. I decided that it was close to a 100-foot drop. I decided I would have to wait for dawn unless outside help reached me first. It was very cold (−4°F.) and the wind was blowing.

"I dug a step into the hill to make myself comfortable. My seat pan in this step made a fairly comfortable seat and, with my parachute tucked around my legs, I was prepared to last the night. (The pilot was not wearing either his winter flight suit or an antiexposure suit. He was wearing his summer orange flight suit with two pair of long johns—one waffle weave. *When operating where bailout, ejection or forced landing in rugged terrain with adverse weather conditions is a possibility, plan and dress for each flight as though you were going to have to walk back.*—Ed.) Then holding my pistol as high as possible through the tangle of brush overhead, I fired three tracers, closely spaced. With the little town so close downstream, I felt hopeful that my tracers would be investigated. I fired an additional tracer five minutes later.

"After firing several of these shells, I was happy to note a bright white light coming around the hill toward me. Then it disappeared and did not reappear until it had passed below me and was several hundred yards beyond. I readied a night flare in order to be able to stop the next vehicle.

"A half hour or so later a motorcycle appeared. I ignited a flare and dropped it over the cliff. The motorcycle stopped, the operator shut off the engine and lights and he and his rider answered my yells. I turned my vest flashlight on myself and stood up to be as visible as possible. After several minutes of 'discussion' these people started to leave. I felt sure they would at least 'advertise' my presence but to be doubly sure, I fired three quick tracers into the air. In retrospect, I think this last effort on my part may have had an adverse effect on their interest in me!

"I was unsuccessful with the next two vehicles. One of my flares fell beyond the road and on down the mountain where it wasn't seen. Another flare stopped a vehicle but the 'conversation' was as fruitless as before.

"My fourth and last flare brought excellent results. The vehicle stopped and after considerable communication between myself and the driver, he backed up about 100 feet and turned his headlights so I could see the cliff on which I had been perched for 2½ hours. Quickly rerigging my parachute lines, I climbed down, hand-over-hand until reaching the end of my lines, I dropped several feet into the brush at the roadside. The driver took me to the home of a policeman who, after tea and cakes were served, accompanied us to local headquarters where I phoned the base."

B-B-B-BABY, IT'S C

PILOT training lectures can really drag and become old. We seem to hear the same things over and over again, so consequently we disregard the monotonous monologues of our illustrious leaders who are doing all the chatting. We have to admit that of all the topics we hear at these sessions, there are several that rate No. 10—always at the bottom of the interest column. One that is typical is that of cold weather gear and survival.

Unless you as a pilot have had to qualify with your trusty M-1 and quick drawing .38 during the mid-Winter months, you cannot appreciate the importance of cold weather gear. I know what I am saying because I have experienced the cold trigger finger and numb toes and it is this that has prompted me to relate an appropriate tale.

The story you are about to read is a true one. The names of persons have been changed so as not to embarrass them, and *not for the purpose of protecting the innocent*, since there was *no such animal in this instance.*

Our story opens with LT Hank Hedgegrover stationed in sunny Florida with VMA 444. The day is Wednesday, twenty-third of December, about 1200 hours. Since LT Hedgegrover is surrounded by palm trees and loads of sunshine, he is completely oblivious of the snow covered countryside just north of the

S COLD OUTSIDE

by CAPT S. M. WILLIAMS, USMC

Mason Dixon line. He is scheduled to have his AD airborne at 1300 on the way home for a two night RON. What a great trip!

Just think, he'll be home for Christmas with his family, all huddling around the warm fireplace. His plan is all filed, VFR all the way. Up to the locker he goes to put on his old flight deck shoes, summer flight suit and mae west.

We now leave old Hank at 9000 feet, 10 minutes north of Savannah for just a minute. And in doing this, let's survey this situation. Happy Hank has not even considered the surface temperature at his destination. If nothing eventful happens, he will at least freeze his bones after shutting down at Lakehurst. Due to his drowsiness during squadron lectures, he will not have the slightest idea what his prestart cold weather procedure is when he's ready for return. Not only that, but he doesn't even know the proper method of oil diluting his aircraft.

We return to Hank while he is giving his position report. ". . . Chincoteague 18/9000 feet; VFR to Lakehurst, over. Roger, Chincoteague altimeter 29.70." As Hank tools on he has to climb to clear the cloud bank ahead. Passing 10, 11, 12, 13 thousand, his airspeed dissipates rapidly as he was not aware of how close the overcast was. Just as he reaches 14,000 with 115 knots, his engine putts, coughs and then catches again. RPM forward, up with the MAP, but still no noticeable increase in power. He noses down to maintain airspeed. Immediately he is on instruments and as he makes his "VFR" letdown through 8000 feet he notices his carburetor temperature in the icing range. At least that's the trouble. If it only clears before . . . 3000 feet . . . Gosh! That altimeter is really unwinding!

There he is 2500 feet in the clear but with 120 knots and no response on increasing the throttle. Luckily it isn't populated very much in that area. Lots of countryside—flat, white countryside. He already realizes he has to make an emergency landing and with it switches to guard. "Mayday! Mayday! Marine 37731 crash landing at . . ." No time to report . . . Straps tight, gas off and ease it into that clearing . . . right over these trees. Out of the bear he leaps!

As he runs to clear the aircraft, snow trickles over his shoe tops—real cold snow too! It is a half hour later when the shock leaves him. His hands are cold now, he has no flight gloves with him since they were conveniently parked on the console so they wouldn't interfere with any smoking that took place.

The sun has dropped below the horizon and the black windy night surrounds our lonely frightened Hank.

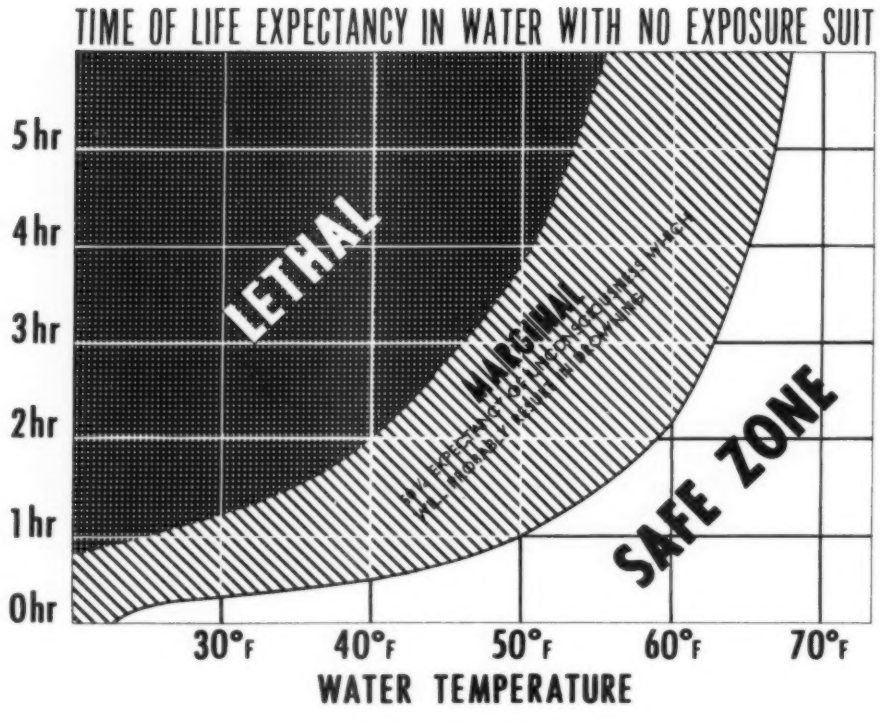
Let's switch our scene to the following noon. We find LT Hedgegrover in the warm room at the U. S. Naval Hospital which in this case happened to be Bethesda, Maryland. Naturally he has suffered from frostbite and exposure, and now totes a minor case of pneumonia. All this *not just because his alternate air system was sluggish,* but *due to his improper dress.* Needless to say Hank spent his Christmas days isolated from any cheering and comforting friends and family.

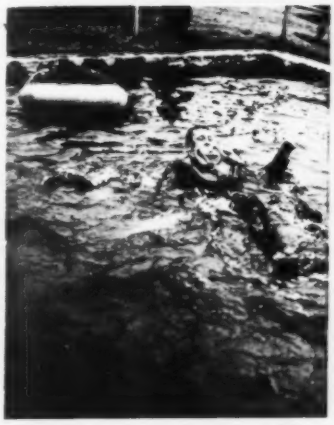
I don't intend to get into the particulars especially the disposition of the accident board as their recommendation is quite evident. What I would like to stress by relating this tale is the necessity of donning proper cold weather gear because *you never can tell.* And luckily in Hank's case it was only 15 hours before SAR picked him up. It could be lots longer.

On your next flight during these cold months just imagine yourself plowing the snow before you as your aircraft comes to a thumping halt in some snow covered field. Unless your aircraft heater furnishes more warm comfort than those I've been in, you'll get a vivid picture.

For your next flight—why not a sweater, heavy underwear, and proper shoes? Whose life is it that's worth saving?

Suit Yourself





Many pilots and crewmen wearing the Mk IV antiexposure suit have endangered their lives by using neck rings to keep the rubber seal from chaffing.

A neck ring can put a permanent set in the neck seal and ruin the watertight integrity of the suit. It is almost impossible to remove a neck ring while you are struggling for survial in cold water. In one case on record, cold water leakage into a pilot's suit through the neck was fatal. In another, the pilot was rescued suffering from exposure, his suit half-filled with water.

(If you are tempted to say why fuss about neck seals in the Mk IV suit when the Mk V suit does not have a tight neck seal, the answer is *that it does.* The Mk V suit is watertight when the zipper is zipped up *all the way* under the wearer's chin.)

Items of survival equipment such as the antiexposure suit are developed and tested with great care and at great cost. So-called modifications and improvements on the fleet level such as the antiexposure suit neck ring can cancel out the equipment's designed function.

—and survive

Members of VF-151 prepare to check the watertight integrity of their Mk IV antiexposure suits in the chilly 38° water of the NAS Atsugi supply sump.

A VERTIGO!

TWO AD-6s took off on an area Fam hop. After 45 minutes of flight (during which the pilots took a quick look at the Wright Memorial), the lead pilot experienced vertigo.

"We headed west toward the acrobatic area of land which stretches west from the river. My wingman was following on my port side a good distance behind. After arriving over the acrobatic area, I was looking for a straight road to use for line-up to practice tactics. Over the center of the area there was a build-up of clouds at about 1200 feet. The haze below reduced visibility to about 1½ miles. There was no definite horizon.

"Seeing that the weather conditions were unsatisfactory for such practice, I decided to reverse course to the river and climb above the clouds. I looked back to check my wingman and commenced a port turn of about 40 degrees of bank at an altitude between 900 and 1000 feet. I was still looking at my wingman when my aircraft began to fall off on its port wing. I leveled the wings immediately and looked over the nose at the ground. I was in a relatively steep dive and heard my wingman yelling 'PULL UP' as I was pulling the nose up. I added power and continued to recover. The aircraft shuddered, rolled slightly from left to right and hit a tree or trees as I pulled out."

After checking engine instruments, the pilot headed back to base where he made a normal landing.

He attributes his vertigo to focusing his attention outside the cockpit on his wingman and to lack of a definite horizon. Under the existing weather conditions, he states, he should have made the turn with reference to instruments rather than visually.

notes from your FLIGHT SURGEON

Angels

AN A4D-2N went over the side after a normal carrier landing. The pilot stayed with the floating aircraft until it cleared the stern of the ship. Having already released his harness, he stood up and climbed into the water on the port side of the aircraft. When he tried to swim away on his back, he discovered his oxygen hose was still connected to the console. Lying face down, he reached underwater into the cockpit and disconnected the hose.

Meanwhile, a helicopter dropped a three-pronged rescue seat into the water. The survivor got free of his parachute and survival gear, climbed on the rescue seat and was hoisted aboard.

In his report of his accident and rescue, the pilot has words of praise for all plane guard helicopters. "I know that the helicopter pilots spend many hours hovering during launches and recoveries," he states. "To many who observe them, this seems a waste of time and a thankless job. Well, I for one—and, I believe, all pilots who fly off carriers—appreciate their work and agree with their nickname, 'Angels.'"

Scuba Diving

The potential hazard of flying to even moderate altitudes too soon after Scuba diving has heretofore received little or no publicity. The Chief of Naval Air Training has requested the Naval School of Aviation Medicine to make an immediate evaluation of this problem and make recommendations concerning Scuba diving activities by flying personnel. Until this information becomes available, it is recommended that aircrew personnel not be permitted to fly to cabin pressures in excess of 5000 feet within 12 hours after Scuba diving to depths below 15 feet.

Maintenance Accident

A ground crewman was working on the early type canopy jettison system of an A4D-1 parked in a hanger at NAS Alameda. He was kneeling in the seat of the aircraft facing aft and threading the cable which leads to the bungee firing mechanism when he accidently triggered the actuating device. Two things were wrong: the bungee was fully pressurized and no safety bar was installed to prevent inadvertent actuation.

The actuating rod sheared at the canopy and the entire upper section of the bungee assembly blew off, striking him in the face and the right forearm. The canopy then fell closed slamming his right arm between it and the cockpit edge. (At the time of the incident report, the ground crewman's injuries were expected to necessitate a 50 to 60 day stay on the sick list.)

It was later learned that the crewman was not as familiar with this earlier type bungee mechanism as he was with the newer type which automatically safeties itself when the canopy is open by disengaging the firing mechanism. Maintenance should not be performed on *either* system unless the canopy bungee is de-pressurized.

This accident was caused by failure to comply with standard maintenance procedure. All maintenance personnel should be aware of the dangers inherent in all types of canopy jettison systems.

Testimonial

After the impact, my actions were mostly reflex and I feel I owe my life to the training I recently received at survival school in the Dilbert Dunker and the helicopter pickup, also to the fact that my harness and seat belt were tight and the airplane didn't sink for approximately 30 seconds.—*AD-5W Pilot After Collision with Water*

Head-to-Foot Protection

PERSONAL survival gear did a good job protecting an S2F pilot in a midair collision and emergency landing. His APH-5 helmet sustained a severe blow on the side as a result of prop shatter in the collision and was dented and cracked both inside and out. The visor shield was torn off. During the remainder of the flight, the pilot experienced periods of unconsciousness due to a brain concussion. Undoubtedly, the flight surgeon reports, the helmet had saved his life.

The copilot who was less seriously injured, flew the return to base and landed the crippled aircraft. On landing impact, the cockpit section disintegrated. The pilot's left MK-IV antiexposure suit boot, although torn on the side and across the toe, protected him from severe ankle and foot injury.

Helicopter Rescue at Sea

All pilots and crewmen should make sure they see the Navy's excellent training film "Helicopter Rescue at Sea." The film, which is in color with sound, runs approximately 20 minutes. It can be obtained from your film distribution point under the number MN-8760-A.

POINT OF SURVIVAL

One of the most valuable pieces of personal survival gear you have is your survival sheath knife. A sharp-edged accessible knife can be a life-saver in a variety of situations. Here are five which occurred in recent months:

Ejection Seat: After a "normal" ejection from an A4D-1, the pilot looked up during parachute descent and saw the ejection seat fouled in the parachute shroudlines some 6 feet above his head. As the parachute had been withdrawn from the pack, the canopy had snagged on the seat, tearing out two sections of one gore. One of the shroudlines had wrapped around the inertia reel lock handle on the seat.

The pilot took his sheath knife from the chest strap of his integrated torso harness and cut the shroudline. The seat came untangled and fell free. The next thing the pilot knew he was below the level of the treetops and landing backwards. He was uninjured.

Two additional points in this case:

- The pilot recommends positioning the knife on the torso harness. He states that he made a deliberate effort to reach his calf during parachute descent but was unable to do so.
- The pilot needlessly exposed himself to the hazard of seat-parachute entanglement by ejecting at 3000 feet with his zero delay lanyard hooked up. As stated in BACSEB 3-60, the lanyard should *not* be hooked up above 1200 feet. At altitudes greater than 1200 feet there is room and time for normal seat separation and parachute deployment without risking seat-parachute entanglement.

Shroudline: An F11F pilot's survival knife saved his life after an overwater ejection. Unable to get back in the parachute sling during descent, he entered the water with his straps fastened and his hands on his parachute harness leg snaps. When he hit the water, the actuating handle of the left leg strap quick ejector snap broke off in his hand, leaving the strap locked. His right leg strap probably came off at this time.

The strong wind pulling the blossomed parachute canopy dragged him through the water. With extreme difficulty he thrust his head above water to gulp a breath of air before he was dragged under again. He managed to bend his right leg, work his hand down past his right knee and grasp his knife from the lower leg of his flight suit. He was swallowing water and beginning to tire rapidly.

As soon as the pilot had the knife, he pulled the top right riser and easily cut through the shroud-lines. As he cut the top left riser, the parachute canopy collapsed and he stopped dead in the water. Although he had inflated his life vest, he was still swallowing water and was able to keep his head above the surface only with great effort. He cut the left leg strap, "slicing his leg in the process."

Two helicopters were in the area. He cut the pararaft lanyard away, pulled out a package of dye marker, and stabbed the envelope with his knife. As the green dye stained the water, the pilot of the nearer helicopter spotted him.

He got into the helicopter sling without difficulty but as he relaxed in the sling he realized he was in a state of shock and was hyperventilating badly. He lost consciousness during the hoist.

Second Knife: When an F8U-1 touched down on a field mirror approach, the nose bumped and bounced and pulled to the right. In spite of the pilot's efforts to control the situation, the aircraft swerved off the runway. The wing came off and the fuselage rolled into a semi-inverted position.

As the pilot pulled the ditching handle and was released from the ejection seat, he fell to the top of the canopy. When he attempted to actuate the canopy release handle, it came off in his hand. He was unable to reach his survival knife on his upper torso harness because of his position.

Though he probably never expected to need it, this pilot carried a spare survival knife on the back of the lower right leg of his flight suit. Without even taking time to remove the knife from its sheath, he jabbed holes in the canopy and broke out the plexiglas. He released his four rocket jet fittings, disconnected his anti-G suit hose and oxygen mask connection and crawled to safety. When he was outside the aircraft he saw it was on fire.

* * *

Canopy: A T28B scheduled for a routine solo gunnery hop crashed during the takeoff phase. Fire broke out.

The NavCad pilot tried to blow the canopy. Unbuckling himself, he turned around and again tried to move the handle to the rear with both hands, then recycled the handle in an attempt to get more pressure. The canopy did not actuate because the lines had ruptured. By this time, the pilot was having difficulty breathing in the heat and smoke.

Taking his survival knife from its sheath on the right lower leg of his flight suit, he hit the canopy several times and punched a small hole. The plexiglas, weakened by the excessive heat, was easy to tear out. The NavCad unbuckled his parachute, stood up in the hole and jumped and rolled away from the plane. He sustained burns of the neck and shoulders. The aircraft was destroyed by fire.

Pararaft Lanyard: An F8U-1 pilot ejected on a gunnery tow mission after his plane was disabled, probably by 20 mm. gunfire from another plane in the formation.

After manually deploying his parachute, he located the pararaft lanyard and attached it to his torso harness. In doing so, he accidentally pulled the D-ring which opens the seat pack and the raft began to slide out. (Since this accident, the PK2 ripcord-pararaft lanyard has been modified to preclude inadvertent opening of the high speed container, ref. BACSEB 14-61.)

He was oscillating through approximately 90 degrees, the raft sliding out a little farther with each oscillation. Disconnecting the left rocket jet fitting to his seat pack, he pulled the raft out and tucked it under his arm. Although the seat pack contained his survival equipment, he disconnected the right rocket fastener and the pack fell the length of the line which holds the raft to the survival equipment container in the seat pack.

With the seat pack as a pendulum, the oscillations then became very severe, so violent at times that air would spill from one side of the parachute canopy. The pilot tried to dampen the oscillations by pulling the parachute risers but was unsuccessful.

Afraid the parachute would collapse, he tried to haul the swinging seat pack back in but he did not have the strength. He then took his survival knife from the lacings of the lower right leg of his anti-G suit and cut the seat pack away. After the seat pack fell free, the parachute stopped oscillating "in short order."

The pilot made a successful water entry, released his parachute, inflated his life vest and inflated and boarded his life raft. He was picked up by helicopter shortly afterward.

NUTS AND BOLTS

—*3rd MAW*

YES SIR!!! NUTS AND BOLTS. That is about as low as you can get on the maintenance pipeline, but how many times have pilots walked or been carried back from a flight because of a misplaced or misused *nut* or *bolt*. Statistics indicate that in numerous cases of engine failure, control locks, equipment inoperative discrepancies, the lack of the proper type or proper security of a nut and/or bolt have been the primary contributing factor.

Recently an F8U pilot experienced very sluggish and almost frozen flight controls. After sweating through some very anxious moments behind the stick he was able to land the million-dollar aircraft without further incident. A thorough inspection was accomplished on the aircraft and, yes, you guessed it, a bolt was found wedged in the flight controls in the fuselage. Now a discrepancy of this kind can cause many man hours wasted while trying to find the cause of the bound controls, but, when the inspecting team found the bolt, it then required many more manhours to find out (1) where the bolt had come from and (2) where the nut was that was supposed to have secured it. All in all the aircraft was off the flight list for over a week while it was being opened up and inspected. All of this was caused by an unobservant mechanic and an even more unobservant inspector.

In the same line of thinking, there was the case of the FJ that had experienced a disconnected throttle control arm at the fuel control. The cause was very easily uncovered, the bolt had backed out because there was no nut to keep it in place. Errors like these are the ones that keep our accident investigators and statisticians in a job. Investigation revealed that the elastic stop nut used in securing the bolt had been reused and that the elastic part of the nut had no securing qualities at all. Further, it was revealed that had the nut been a good one, the same incident would have happened at a later date as the bolt being used was not long enough to completely grip the elastic part of the nut.

The foregoing case was actual and not devised. These cases were affected by experienced personnel who should have known better. There are many explicit rules set forth for the use of the proper bolt and stop nut in various manuals. A–schools teach their proper use as do the B–schools. In the case of the fuel control control arm becoming disconnected, there is a definite statement in the FJ Handbook of Maintenance Instructions concerning the reuse of elastic stop nuts in this position. The caution is contained on page 5-56 and reads, *"Caution: All lock nuts in engine control system should be used only once."* We know that some people would say that replacement of the removed nut is not necessary because it feels tight when it is installed. This has no bearing on the case. **If it is spelled out that they will not be reused, then discard them. A tight feel is not a sufficient indication that the locking device is working.**

The case of the FJ handbook is not a remote one. Every handbook has at least one caution against the reuse of an elastic stop nut in a certain position and it is up to the supervisors and inspectors to see that these regulations are adhered to. The cost of an aircraft and a pilot far excedes the cost of a new nut.

But then again there are the cases wherein a nut is installed on a bolt that is too short for the job or the nut has been used too many times to be effective. The guides to follow for the use of these stop nuts and their accompanying bolts is contained in AN 01-1A-1 page 4 paragraph 5.a. under *Caution*. That section is quoted in part:

> "When elastic stop nuts are reused, care should be exercised that the fiber has not lost its usefulness.
>
> "After nut has been tightened, round or chamfered end bolts or screws must extend the full round or chamfer through the nut. Flat end bolts or screws must extend at *least* $\frac{1}{32}$-inch through the nut.
>
> "Don't use sawed off bolts that have rough ends. File off all burrs before applying the nut.
>
> "Don't tap the fiber collar. The self-locking action of elastic stop nut is accomplished by permitting the bolt threads to impress themselves into the untapped fiber.
>
> "Don't install elastic stop nuts in positions where the temperature is higher than 121°C. (250°F.). Beyond that point, the effectiveness of the self locking nut is reduced."

There are self locking nuts of the metallic type and other types that can be used around higher temperatures. The same rules apply to these nuts that apply to the elastic stop nut in so far as the method of installation is concerned.

But that isn't the end of our discussion concerning self locking nuts and their bolts.. AN 01-1A-8 also contains a great amount of pertinent information concerning the proper uses of both of these pieces of hardware. Another caution is quoted from this manual:

> "Self-locking nuts will not be used at joints in control systems of aircraft structure when movement of the joint may result in motion of the nut relative to the surface on which it is bearing. They may be used with anti-friction bearings and control pulleys provided the inner race of the bearing is clamped to the supporting structure by the nut and bolt." Again it is repeated herein that a self locking nut that can be installed on a bolt by hand through the locking device should be discarded. Also, a self locking

nut should *never* be tapped. Screw the nut on to the bolt by hand to insure it is not cross-threaded and then accomplish further tightening with the proper wrench or socket.

There are five general types of self-locking nuts available for specific jobs. They are:

Boots Rol-Top Nut	Boots Bellows Style Hexagon	Flexloc Nut	Non-metallic Insert Lock Nut	Elastic Stop Nut

Each and every one of these locking type nuts is to be used and treated the same with the exception of its location in relation to the subjected heat. For information concerning this heat factor, refer to either of the two foregoing manuals.

Another manual which contains some very good information including nuts, bolts and other aircraft hardware and their security is Technical Manual, General Maintenance Instructions AN 01-1A-1. The closest publication number to Navy is NavOrd SWOP 40-54. The value of the information in this manual and the two already mentioned cannot be overemphasized. The proper security of all type of aircraft hardware is a maintenance factor that could conceivably erase may of the pilot reported discrepancies and some of those he doesn't get to report because the aircraft augers a hole in the hills.

Remember—There are strict and explicit rules governing the use of elastic or self locking nuts. These regulations have been set up to prevent aircraft accidents and pilot fatalities. The individual handbooks of maintenance instruction are to be rigidly adhered to. Pass the word when you see these items of hardware being misused and abused.

There are specific nuts and bolts to use in certain places on the aircraft and its components—Use the right one—Don't turn laxity into fatality.

MAINTENANCE PROFESSIONALISM

Fifty years ago there were three recognized professions—medicine, law and teaching. Today, up to our eyebrows in technology, we think of any occupation requiring exacting training and the application of skill, as a profession. Without natural intelligence, plus extensive training, you couldn't be a maintenance man. You are working at a profession.

Unfortunately, merely working at a profession makes no one "professional", for the professional is one who conforms to the standards of his profession.

What are the standards of your profession? Very simply, they are three: the conscientious application of your skill to the work at hand, careful adherence to the methods, procedures and techniques prescribed, performance with a sense of responsibility to yourself, your colleagues, your organization and your country.

All of us talk a great deal these days about the dollar cost of defense—so many million dollars for this weapon system, so many million dollars for that one. Well and good, for dollars are vital. But remember that dollars alone can achieve nothing. They are effective only when coupled with your trained mind and your skilled hands—your professionalism. You are one man in a long chain of men, from the theoretical physicist who puts the system on paper and thinks it might work, to the operator who puts the system into the sky and proves that it will work. But it will work only when each man along the way has conformed to the standards of his own profession. —*from USAF*

BACKYARD BANJO

Emergency landing leaves forlorn aftermath

A few shovels full before dropping the gear

Almost ready to move out

This tired old F2H-3 was going to the boneyard at NAF Litchfield, Arizona but the pilot became lost on top of an overcast and with fuel at a decision point (400 pounds) he spotted a small dirt airstrip in the mountains and bellied it in. As it turned out the location was 90 miles south of the Border.

With the assistance of a local citizen, a trench was bulldozed at the edge of the runway and the aircraft was then dragged over the trench (by the tailhook). When the mechanical uplocks were released the gear fell into position and it became a simple matter to tow the plane out by its nose strut.

Road conditions made complete salvage practically impossible so usable equipment was removed and the hulk abandoned.

At sea you can sink the wreckage with gunfire but what to do with dry land wreckage? The same local man who had assisted in getting the aircraft back on its feet decided it would make a good memento of the occasion. With the permission of the town mayor he took possession of the aircraft and towed it off to his home—probably the only residence in Mexico with a McDonnell motif.

Continued

Final weight and balance is awful

Loose Interconnector

This F9F-8 had flown 13.3 hours since coming out of check (180 hr. 2nd intermediate). On this flight the pilot noticed nothing wrong until after shutdown. As the pilot got out of the aircraft he noticed smoke coming from the port intake. He then saw smoke coming from under the fuselage. Investigation revealed a hole in the bottom of the fuselage and a burned out interconnector between the No. 5 and No. 6 combustion chambers (See photo).

Only one bolt was found securing the interconnector elbow on combustion chamber No. 5. This was due to the other two bolts being improperly installed, or possibly not installed during the last intermediate inspection.

This condition allowed combustion gases to burn the elbow fitting which subsequently failed on this flight. This failure then allowed combustion gases to burn a hole in the aircraft near the No. 5 and No. 6 combustion chambers.

Board Comments: The cause of this incident was most probably maintenance error in failing to properly re-install all three bolts in the interconnector elbow fitting on burner can No. 5.

The particular elbow involved in this incident is hidden from view by tubing when the engine is completely assembled and apparently was overlooked during a cursory inspection.

The importance of meticulous attention to inspection procedures and of the absolute necessity for work of the highest quality regardless of pressure due to increased operating commitments and personnel shortages, cannot be overemphasized.

An unusually high number of similar occurrences have been received indicating this item of inspection merits a second look by Cougar *operators—Ed.*

Aircraft Escape System Maintenance

The failure of maintenance personnel to attach the automatic parachute arming cable properly at the ditching handle recently necessitated the pilot's manual deployment of the parachute following ejection.

Improper assembly had allowed the cable to pull out without actuating the auto parachute opener. Maintenance supervisors had failed to notice that it was not properly installed. The pilot overlooked it on preflight.

Maintenance personnel must perform work on escape systems and survival equipment as if their own lives were going to depend on its function and operation. Supervisory personnel and inspectors must be aware of their responsibility for flawless work performance. Pilots must realize that extra minutes spent in preflighting can pay off in years of life.

Recaps Damage

When a recap is missing from a landing gear tire—look for secondary damage in the area which may rate first importance. Visualize a recaps departure from the aircraft. It doesn't just gently slip off and quietly lie down on the edge of the runway. First its bond to the carcass must have deteriorated. Then a break in its cross-section provides an opening for runway friction and centrifugal pull to grab the recap and go to work. As it peels off the forces of separation increase quickly and immediately produce a flailing mass of rubber that beats nacelle, gear and adjacent components in its path.

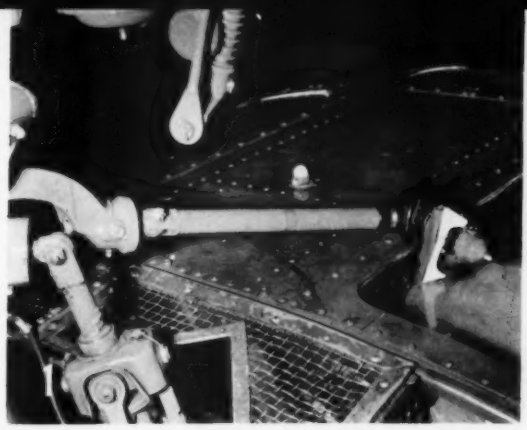
When a recap leaves us it usually does so violently.

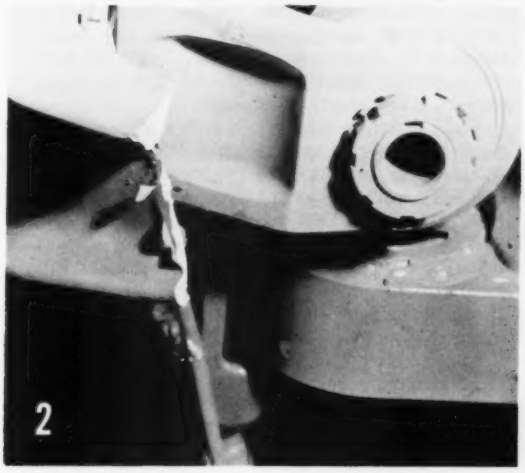
The following incident reveals the latitude of damage on a *Convair*. Following replacement of a tire and wheel because of a shed tread, a walk-around inspection revealed a bashed-in beaver tail. Condition was approved 'til next Periodic Check. The following day a crew reported that the left door for the nose gear hung open one and a half inches. After repairs and re-rigging the nose gear doors, it was found that the left main gear doors did not close completely. Investigation revealed inboard door hinges bent, causing the door to move forward so that the closing arm rode on the nut which secures the roller in the bracket at the rear.

The floppy tread on that tire really got around—it knocked items out of line in three separate areas without leaving glaring signs of damage. The chances of a shed tread leaving without beating up the aircraft are very slim—best always check for obscure but serious damage in all areas.—*AA Weekly Maint Ltr*

An Endorsement

"It is noted that the Ground Accident Report lists only a nonrated man as trouble shooter for an electrical discrepancy being worked off on the aircraft. It appears that no supervisory personnel were involved. The lack of such personnel, who should be overseeing the work of nonrated men engaged in correcting aircraft discrepancies, speaks unfavorably for the squadron's maintenance safety program. Direct supervision of aircraft maintenance work by personnel of technical competence and professional skill has done much to reduce Navy aircraft ground accidents. The commanding officer is directed to insure that adequate on the job supervision is an established part of the squadron's accident prevention program."





Twist Right

This accident occurred in the process of folding the HSS-1's forward starboard rotor blade. The horn locking pin was partially removed, then the taper pin removed and the blade walked aft with the horn assembly breaking as the blade reached approximately 45 degrees.

Horn assembly was broken approximately two inches from the control rod assembly, see photos 1 and 2, requiring replacement of the rotor head.

The crewmember at the rotor head did not positively ascertain the complete disengagement of the horn locking pin, but erroneously assumed that the locking pin had reached the full retracted position when resistance to further rotation of the knurled locking pin knob was encountered. Since several threads of locking pin travel remained the pin was not completely disengaged.

Recommendations: That the rotor blade be rotated sufficiently by the man at the rotor head to positively establish the complete removal of the horn locking pin before removing the taper pin.

Find Missing Cap

During a dusk section takeoff in combat power, the wingman flying an F8U-1 was unable to rotate to a flying attitude with the lead aircraft at about 125 knots. Plans for an aborted takeoff were abandoned after selecting military power because at this time 5000 feet of runway remained with an aircraft speed of 150 knots. Lift-off was accomplished with increased nose up pitch trim at 170-180 knots. After checking flight characteristics and dumping fuel at 10,000 feet a normal landing approach was initiated. Touchdown was at 138 knots with normal UHT control. When the main landing gear touched the runway, the nose fell through to the runway and full back stick would not raise the nose; however, the landing was completed without further incident.

The established factor of other personnel is assigned to this report because the AN no. 4 cap from the aft viscous damper was found lodged in the UHT variable gain idler linkage (Part CV15-158074-1(2)). This cap was evidently dropped during servicing because another cap was found installed on the viscous damper during the investigation. The normal terminus of objects dropped through the servicing access is in the variable gain idler linkage (See photo 1).

Comments: The aft viscous damper servicing connection, by design, lends itself to this type of incident.

This would have, no doubt, been a STRIKE/FATAL accident report had the launch occurred aboard ship.

The post-start checks failed to reveal the restricted up UHT movement because the TRIM circuit was completely operative and the procedure for wiping out the cockpit is not effective for checking full and complete throw of the control surfaces.

Recommendations: That maintenance personnel be continually impressed as to the extreme importance of always following established procedures for servicing and repairing aircraft, being particularly careful to prevent foreign or unsecured objects from entering the aircraft. Further, if any object is lost during repair or servicing, that the aircraft be grounded until an inspection is completed by competent personnel.

That an investigation be made to consider the feasibility of installing a servicing part for the aft viscous damper similar in design to the forward installation.

That, if such a change in design is not to be considered, a local fix be adopted as follows:

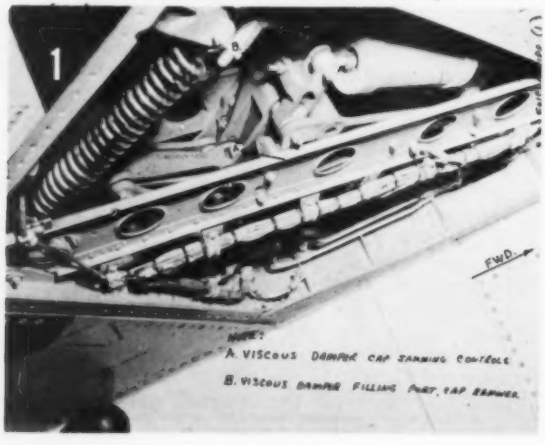
Remove the circular access cover from the R.H. horizontal tail control door assembly part no. CV15-150038-026.

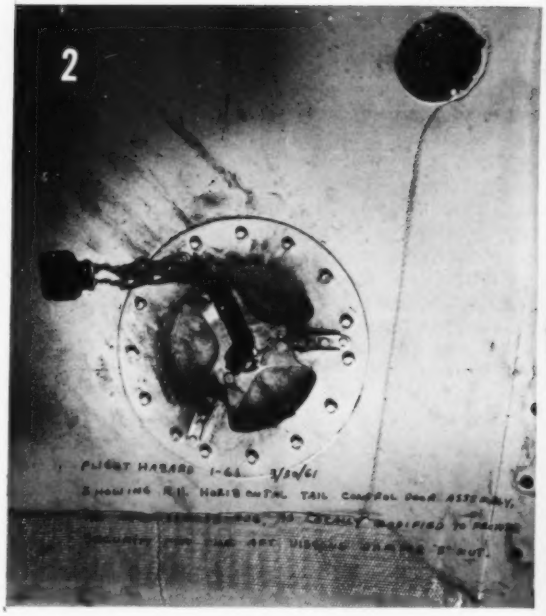
Drill the center of the cover to accommodate a screw, part no. AN509-8-32-NC-3A.

Attach approximately eight links of bronze chain G 4010-288-9930 to the cover.

Drill a hole with a number 45 drill through the cap portion of the AN 4 cap, part no. AN 929-4, in order to attach it to the chain.

This fix prevents accidental loss of the viscous damper cap during servicing. (See photo 2.) That the post-start checks be modified to provide positive inspection for full throw of all controls. The use of bench marks painted on the fuselage adjacent to the UHT would provide the plane captain with the reference needed to observe full throw of the UHT.





Quotable Quote

Line Chief: "Briefing my men on safety and other technical matters during the morning muster has been most effective—It gives me an opportunity to know my men better and to personally conduct maintenance and safety briefings."

Missing—Cotter Pins

During transition to a hover from a normal approach the pilot of an HTL felt a distinct thump in the rudder pedals and then lost directional control. The aircraft rotated 180 degrees due to torque effect before a safe landing was made.

The following factors are considered pertinent to this incident:

All evidence pointed to the fact that the castellated retaining nut was not secured with a cotter pin and the nut backed off in flight, releasing the connection between the pitch link and tail rotor drive head assembly. A similar nut on the other pitch linkage had not backed off, but it also was not secured with a cotter pin.

Investigation revealed the tail rotor control cable was changed the previous day and it was necessary to remove the pitch linkage to re-rig the tail rotor.

Personnel performing the work failed to install the cotter pins. *The inspector failed to check their work;* the test pilot took it for granted that the installation was complete and so did four other pilots on subsequent flights before the incident occurred.

The castellated nut-cotter pin installation represents one of the best fasteners in use in aviation today and when installed properly can be depended upon to do its job with complete safety.

It is absolutely mandatory that all maintenance personnel be consistently reminded that no special directive or maintenance procedure can ever take the place of thorough and complete *maintenance, inspection and supervision.*

Pilot complacency in regard to a thorough preflight inspection is evidenced in this Flight Hazard, since the tail rotor installation is readily accessible and a visual check on its security is part of the preflight.

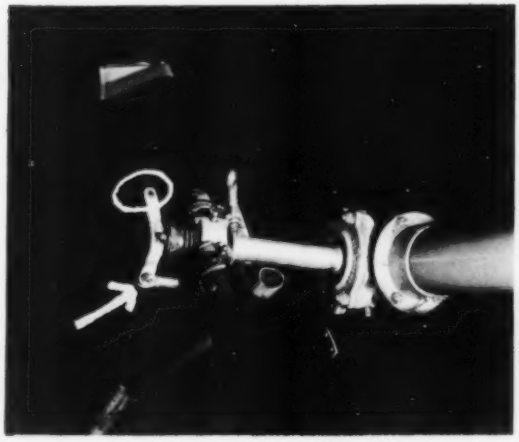
Recommendations: That Supervisory Personnel reemphasize the importance of effective maintenance Inspection and Quality Control Programs to insure work of the highest quality.

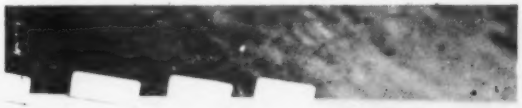
That all flight instructors continue to stress the importance of a thorough preflight inspection; the necessity for maintaining a high degree of alertness for possible loss of tail rotor directional control in flight, and indoctrinate student pilots thoroughly on the landing technique required in the event of such malfunction.

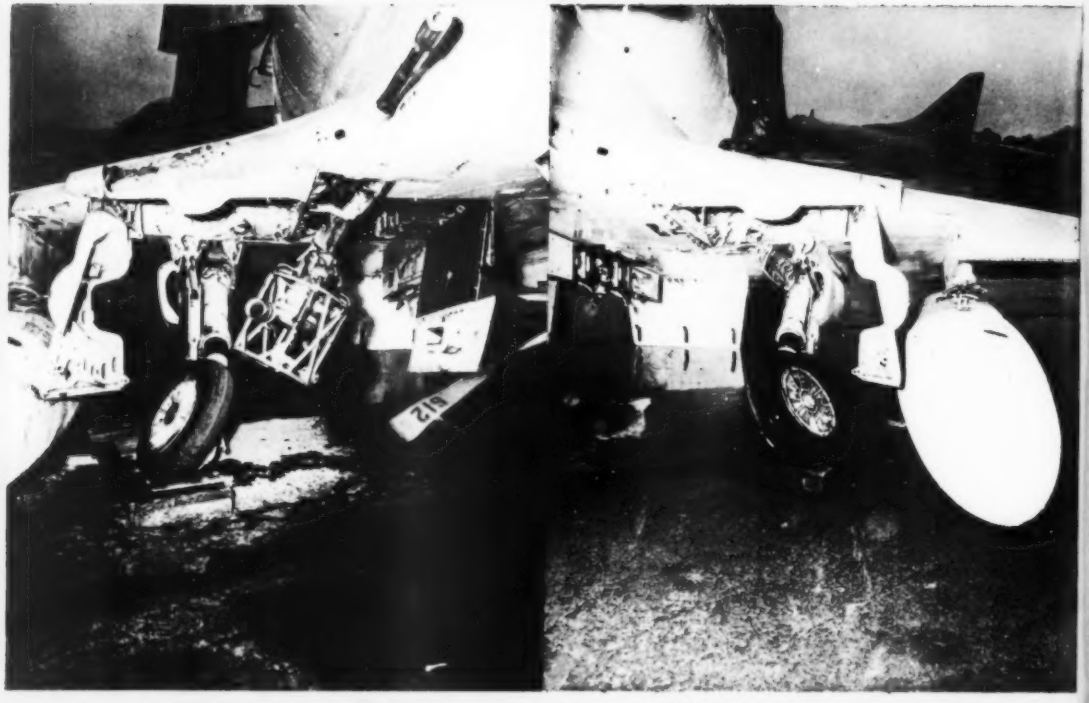
Scorched

The exhaust blast from one A4D against the starboard wing slat of another A4D resulted in severe scorching and heat distortion of the slat assembly. To prevent recurrence of this type of mishap, taxi directors should insure that, when spotting an aircraft the previous aircraft is shut down before directing another aircraft into the close proximity that is required for flight deck spots. Pilots should be ever alert to prevent any similar occurrence, if detected, since the ultimate responsibility of the handling of the aircraft rests with the pilot.

Continued next page







Composite view following ground turnup. When the engine accelerated, the main gear collapsed.

Missing Pins

This A4D-2 was spotted in the line area for an idle turnup to check a repaired discrepancy on the dive brake system. The aircraft was started in the normal manner except that there were no locking pins inserted in the main landing gear. The mechanic conducting the turnup stated that the landing gear handle was DOWN prior to initiating the engine turnup. Nevertheless, as the engine reached sufficient RPM to produce hydraulic pressure, the main landing gear collapsed. The engine was secured immediately upon feeling the aircraft start to settle.

It was not possible to determine the exact cause of the accident. It is suspected that the gear handle may have been in an intermediate position (other than DOWN or UP) when the gear collapsed. It is conceivable that the mech might have repositioned the gear handle accidentally after he had conducted his cockpit pre-start check and prior to the time when the landing gear collapsed during the start. The mech had stood up and moved about in the cockpit to assist the ground crew in correcting discrepancy on the airstart unit.

The investigation revealed a possible malfunction in the landing gear control handle safety stop and solenoid—a more than normal amount of play in the landing gear handle was detected.

The reporting unit requires that main and nose gear ground locking pins be installed on all aircraft landing gear upon return from a flight prior to shutting down the engine. These are not to be removed until after the engine is started for subsequent flights and a signal is given by the pilot to the plane captain that all three landing gears indicate down and locked. The only other times the ground locking pins shall be removed while the aircraft is on the deck are for servicing and maintaining the landing gear system.

It is recommended that squadron maintenance personnel be continually reminded of the mandatory use of ground locking pins in the landing gear. Also, that personnel working in aircraft cockpits be impressed with the fact that extreme caution must be exercised to avoid inadvertent changing of switches and selectors.

Maintainability

MAINTAINABILITY should be a subject of special interest to all maintenance personnel to insure that present and future weapon systems are operationally ready for their designed purpose, rather than out of commission for maintenance.

In the present era of employing and progressively acquiring more complex weapon systems, the requirement of implementing fully the maintainability program has become increasingly important. This program can be completely successful only through the efforts of all personnel at every maintenance level. Continous evaluation and refinement of established maintenance methods, techniques, and procedures provide the basis of insuring greater maintainability of new weapon systems.

Accurate and prompt maintenance data reporting, collection, processing and material deficiency reporting (FURs) provide an essential part of the maintainability program. The importance of conscientious and complete maintenance data reporting cannot be overemphasized. Comparisons and analyses made from collected basic maintenance data not only provide vital maintenance management tools for current operations, but portray reliability expectancy for systems and components, design deficiencies, future inspection criteria, and other facets applicable to the maintainability program.—*From TIG Briefs*

Maintainability Improves Reliability–

MAINTAINABILITY is a subject akin to reliability. The former is concerned with the cost, both money and time, to keep engines flying; the latter is concerned with the probability of mission success.

Like reliability, there is a need to quantitatively measure maintainability. The total cost of maintenance is dependent upon the cost of destroyed parts, the cost of inspection, the cost of replacing components, and the cost of repairing components at field and depot level.

For the present, emphasis is being placed on the maintenance man-hours expended at field level. This time is divided into two categories—that expended on scheduled maintenance and that on unscheduled maintenance.

Scheduled maintenance time is charged to periodic inspection, preflight and postflight inspections, and scheduled removals. Unscheduled maintenance time is that required for correcting faults and also for Service Change compliance. The index in each category is the maintenance man-hours per engine flight hour.

Reliability and maintainability together give an indication of weapon system capability in terms of keeping the system in a flight-ready status and its completing a mission once it has started.

—*GE Jet Service News*

Design for Safety

"SAFETY is an integral part of our efficient operation. For an operation to be completely successful, safety must be born in the design, mature with the plan, and pay off with successful completion of the mission.—Safety must be designed into the aircraft and mission, not sealed in a First Aid Kit and applied only when the need arises.

"It is a mathematical fact that the money required to replace one present day interceptor aircraft, lost due to a preventable accident, would offset the cost of accident prevention in the entire Air Defense Command for the next 10 years."

—*Blueprint for Safety*

Parker Fuel Nozzle Use

SOME aircraft ground crew personnel are incorrectly utilizing the sequence lever of the Parker pressure fueling nozzle at the start of aircraft pressure fueling operations.

The design of the Parker fueling nozzle is unique in that it embodies a feature which permits the nozzle operator to open and close a fuel flow valve inside the nozzle by use of a sequence lever mounted on the side of the nozzle. After attaching the fueling nozzle to the aircraft, some operators are not moving this sequence lever past the "hump" and *locking* the fuel flow valve in the full open position.

If the sequence lever is not locked fully open, the fuel flow valve, which is attached through a linkage to the sequence lever, will move towards the closed position whenever fuel flow through the nozzle is decreased. Thus, as the fuel flow valve moves to the closed position, the sequence lever of the nozzle also moves toward the closed position.

The fuel flow through the nozzle is decreased whenever the various automatic fuel shutoff valves, *within the aircraft*, close as a result of either:

(a) conducting the aircraft primary and sec-

ondary fueling pre-checks, or

(b) allowing the aircraft tanks to fill to the automatic shutoff level.

Unless a flowmeter or the aircraft fuel quantity gages are used to monitor fuel flow stoppage, when conducting the aircraft primary and secondary fueling pre-checks, there is no positive assurance that all aircraft automatic fuel shutoff valves have indeed functioned as intended.

Therefore, monitoring the aircraft primary and secondary fueling pre-check operation by merely observing the movement of the sequence lever on the Parker fueling nozzle is grossly in error and is in contradiction to proper fueling procedures.

It is mandatory that the sequence lever of the Parker fueling nozzle be locked in the full open position for all fuelings.

It is urgently recommended that those personnel, who actually fuel the aircraft, study the fueling portions of the appropriate handbook of maintenance instructions.

—*BuWeps*

Prevention of Nose Wheel and Tire Failures

FAILURES of the nose wheel and tire on the F4D has been a continual problem during carrier operations. Here's VF-13's own story of how a determined maintenance crew controls this problem. It is felt that this is a good example of what initiative and determination can contribute to aircraft *safety*.

VF-13 experienced numerous failures of F4D-1 nose wheels and tires after beginning shipboard operations in May 1960. The nose wheels failed on the initial down thrust of the strut during the catapult shot. As the shock passed down the strut to the wheel, it bottomed the wheel rim on the deck, cracking and chipping the assembly. The tires were blown on landing if they had not already blown on the catapult shot.

A three-inch nose wheel offset on the catapult was used in an attempt to keep the nose tire from compressing into the catapult track. This however, failed to solve the problem. After consulting extensively with VF-74 during the turnover conference at Rota, Spain, it was decided to return to a nose wheel centered position on the catapult.

Upon leaving the U. S. for a Mediterranean deployment, the maintenance crew started keeping a record of all strut and tire pressures and the number of catapult shots on each wheel. All struts were carefully serviced for air and fluid level, and the tires were checked for correct pressure. A one-inch strip of masking tape was wrapped around the bottom of each nose wheel strut so that a compressed tape would show evidence of strut bottoming.

From 11 February 1961 to present, only one nose wheel failure in 182 catapult shots has occurred. Upon examination of the strut pressure on this aircraft after its return aboard, it was found that the air pressure in the strut was 35 lbs. low. The nose wheel failed on the tenth catapult launch after complete servicing. The strut bottomed. The wheel was chipped; the tire was cut but did not blow. The strut had been compressed on the previous evening for an afterburner removal. It had been serviced for air pressure but not for fluid.

Very close attention to strut servicing is the key to prevention of nose wheel failures on the catapult. Offsetting the aircraft on the catapult track is unnecessary. Particular attention must be given to the fluid level. Air pressure should be the maximum allowable (190 psi fully extended) and the nose tire serviced to 325 psi. If a strut is lowered for maintenance work it should be completely re-serviced *including fluid level* upon completion of the work. Masking tape should be wrapped around the bottom of the nose strut to give an indication of bottoming due to decreasing fluid level. When bottoming appears imminent, fluid level should be corrected. Strut air pressures should be checked weekly or after 10 catapult shots whichever comes first. Strut servicing only during normal maintenance checks is insufficient to maintain all aircraft struts with proper air pressures and fluid levels.

MURPHY'S LAW*

* If an aircraft part can be installed incorrectly, someone will install it that way!

F4H Reversed Cylinders and Crossed Lines

Although designers strive to eliminate conditions in which Murphy's Law can operate, a few always remain to harass pilots and maintenance personnel. Two in particular on the F4H-1 may have serious consequences if they are not discovered before flight. It is hoped that maintenance supervisors will take note of these two areas and be particularly observant when work is done on these systems.

One Murphy has to do with the rudder feel cylinder; the other concerns the normal and emergency brake lines. The rudder feel cylinder, part no. 32-69311-1, can be installed backwards, and the pressure and return flex lines to it, part no. YR5800-4-0186, can be crossed. The result in flight of either situation is a full uncontrollable rudder deflection as the airspeed switch goes to the high speed selection. The circuit breaker isolating the airspeed switch electrically is in the rear cockpit; therefore control can be regained most quickly only by slowing down.

In this case it is not hard to visualize the control problems a pilot might encounter on a cat shot, for instance, with external fuel tanks or a special store. An abrupt full rudder and the associated yaw and roll under these conditions could be disastrous.

Reversed brake lines are obviously very dangerous, particularly on the carrier. One instance of reversed normal brake lines went undetected during taxi and ground tests of the nose gear steering system until the pilot needed a touch of only one brake. Then it quickly became apparent. Because of nose gear steering it had not been immediately recognized.

Unfortunately, there are several places where the normal brakes can be reversed, as in the 27L door area. Since the lines are adjacent for 10 or 15 feet of tubing, several opportunities for crossing exist. The same holds true for the emergency brake lines, although the method of emergency brake application makes a crossed line less serious in this system.

Only by reference to the HMI and by careful work can these Murphys be avoided.

MONITOR

Night Takeoff SOP

One of the members stated that night takeoff procedures should again be brought out at the weekly safety meeting. He recently completed a night takeoff and did not transition to instruments soon enough. The plane commander recognized that he was attempting to control the aircraft by visual reference only and told him to check his instruments. He had been briefed before regarding this problem during night takeoffs but had not made a night flight lately.—*NAS Minneapolis Acft Accident Prevention Board*

Pass the Word

Concerning a fatal HOK-1 accident: The instruction requiring wiring of the T-handle for the emergency ejection of the cabin door was known in other commands but was not known to this unit, indicating a breakdown in our passing the proper dope down the line.—*1st MAW*

Emergency Packet Distribution

The committee recommended that an emergency packet be sent to each divert field in the Med and to all destroyers acting as plane guards for this ship. This packet to contain such items as pictures of the various types of aircraft with clearly marked emergency exits, escape handles.—*USS* SARATOGA

In the Blind

The air department officer stated that the air space starboard and forward of the island is a blind spot for Pri-Fly. Planes must call in when breaking in this area.—*USS* INDEPENDENCE

Night Lights

The position of the field emergency arresting gear should be marked with lights for night operations. Shields for the taxi lights were suggested to prevent damage by A3D-2P drogue chutes.—*FAirSoWestPac*

Alcohol Guards

Several instances were cited of inadvertent operation of the carburetor alcohol switches in the P2V-7 which resulted in exhaust stack fires. Each case noted occurred on the ground after landing, and in one case the fire developed in the exhaust stacks after the engine was stopped (no damage resulted). These switches, which are located on the overhead panel in the cockpit, can be accidently turned ON or OFF by the head or shoulder of any person moving into or out of the cockpit. It was recommended that a small guard be placed adjacent to these switches.—*ComFAirQuonset*

EXCERPTS FROM SOME OF THE NAVY'S SAFETY COUNCILS THROUGHOUT THE WORLD, WHO PROVIDE LOCAL LEADERSHIP AND EMPHASIS TO THE NAVAL AVIATION SAFETY PROGRAM.

WELL DONE

ALERTNESS on the part of tower operator Derald E. Vanderpool, AC3 prevented a mid-air collision from occurring in the traffic pattern at NAS Los Alamitos.

The near miss occurred at approximately 1630 on 24 June 1961. The pilot of an F9F-8B was approaching the 180-degree position on the downwind leg of the traffic pattern to runway 22 Left when Vanderpool noticed a 4-engine Douglas transport approaching the field from the northeast at an altitude between 1000-1500 feet. He immediately alerted the jet pilot, who appeared to be on a collision course with the transport at traffic pattern altitudes.

Because of the timely warning the *Cougar* pilot took immediate evasive action—pulling up and to the right passing over the transport. At no time did Vanderpool have radio contact with the transport, which continued on course across the field. At the time of the incident visibility was restricted due to haze, the air was congested with radio traffic and air traffic was heavy in the vicinity of Los Alamitos.

Later the pilot of the F9F-8B admitted that if it hadn't been for Vanderpool's warning in all probability a midair collison would have resulted.

APPROACH congratulates and commends tower operator Derald E. Vanderpool, AC3 for recognizing an emergency situation and taking the only action which could avert a tragic disaster.

"All that is necessary for the myriad little obstacles that beset any flight to combine into an accident is for enough good men to do nothing"

—Edmund Burke (edited slightly)